

22102033982

**Med**  
**K4604**





# FAMILIAR TREES.







*Bouleau (blanc).*

SILVER BIRCH.

Weißbirke.

# FAMILIAR TREES

BY

G. S. BOULGER F.L.S. F.G.S.

WITH

*COLOURED PLATES*

BY

W. H. J. BOOT

---

*Second Series*

---

CASSELL AND COMPANY LIMITED

*LONDON PARIS & MELBOURNE*

---

ALL RIGHTS RESERVED

710 029



WELLCOME INSTITUTE LIBRARY	
Coll.	weIMOmec
Call	
No.	QK

## P R E F A C E.

---

WITH the present second series of twenty trees this work is completed, including as it does almost all our native sylvæ, as well as those exotic species which by their widespread cultivation may be truly said to be "familiar." It is almost unnecessary to acknowledge the writer's great indebtedness to the labours of his predecessors—to Turner, Gerard, Evelyn, Gilpin, and above all Loudon, whose "Arboretum" deals with the whole subject in the completest manner possible; but the account of every tree in this book has been the result of personal study prolonged in most cases over many years. Any reader who really appreciates trees will understand that it has been a labour of love. In the words of Dr. O. W. Holmes, "If we find 'our warmest welcome at an inn,' we find our most soothing companionship in trees among which we have lived, some of which we may ourselves have planted. We lean against them and they never betray our trust; they shield us from the sun and from the rain; their spring welcome is a new birth which never loses its freshness; they lay their beautiful robes at our feet in autumn; in winter they 'stand and wait,' emblems of patience and of truth, for they hide nothing, not even the little leaf-buds which hint to us of hope, the last element in their triple symbolism."





# CONTENTS.



	PAGE
THE BIRCH . . . . .	1
THE ACACIA (ROBINIA PSEUD-ACACIA). . . . .	9
THE COMMON OR CHERRY LAUREL . . . . .	17
THE COMMON ELM . . . . .	25
THE MAPLE . . . . .	33
THE CEDAR OF LEBANON . . . . .	41
THE HAZEL . . . . .	49
THE YEW . . . . .	57
THE ALDER . . . . .	65
THE SPRUCE FIR . . . . .	73
THE ASPEN . . . . .	81
THE ASH . . . . .	89
THE WALNUT . . . . .	97
THE SPINDLE-TREE . . . . .	105
THE STONE PINE . . . . .	113
THE PLUM . . . . .	121
THE BOX . . . . .	129
THE WYCH ELM . . . . .	137
THE PEAR. . . . .	145
THE CYPRESS . . . . .	153



## BOTANICAL SYNOPSIS.

---

THE following is a summary, in language as little technical as is consistent with our limited space, of the distinctive botanical characters of the trees dealt with in the present volume, arranged in systematic order :—

### ANGIOSPERMIA (FRUIT-BEARERS).

---

#### *NATURAL ORDER, CELASTRINEÆ (SPINDLE-TREE FAMILY).*

**EUONYMUS EUROPÆUS**, L. The Spindle-tree. Bark, smooth, grey. Shoots quadrangular, green, fetid. Leaves opposite, ovate-lanceolate, finely-serrate, smooth. Flowers pale-green, half an inch in diameter, parts in fours. Fruit a rose-coloured, four-angled, fleshy capsule, containing four orange seeds. Flowering May—June. Distribution, Europe, West Siberia, and North Africa.

#### *NATURAL ORDER, ACERINEÆ (MAPLE FAMILY).*

**ACER CAMPESTRE**, L. The Maple. Bark furrowed, corky. Leaves opposite, cordate, two inches across, palmately five-lobed, lobes obtuse; stalks red. Flowers in erect, terminal clusters, green, downy. Fruit a two-winged samara, wings spreading horizontally, oblong, half an

inch long, reddish. May.—June. Europe, from Denmark southward, and West Asia.

*NATURAL ORDER, LEGUMINOSÆ (PEA AND BEAN FAMILY).*

**ROBINIA PSEUD-ACACIA**, L. The Acacia. Bark furrowed. Leaves pinnate, of from four to nine pairs of egg-shaped leaflets, and a terminal one, each about an inch long, with two stipular thorns. Flowers in long pendulous racemes, white, fragrant, papilionaceous. Fruit a flat legume with ventral flange. June—July. Carolina to Canada.

*NATURAL ORDER, ROSACEÆ (ROSE FAMILY).*

**PRUNUS COMMUNIS**, HUDSON. The Plum. Bark smooth. Branches spinous. Leaves alternate, convolute, variable. Flowers solitary or in pairs, shortly stalked, white. Fruit a glaucous purple, black, or yellow drupe. March—April. Europe, West Asia, and North Africa.

Sub-species *P. spinosa*, L. The Sloe or Blackthorn. Bark black. Branches numerous. Flowers preceding leaves. Drupe globose, erect, black, half an inch in diameter. Europe.

Sub-species *P. insititia*, L. The Bullace. Bark brown. Branches fewer, less spinous. Flowers with the leaves. Drupe globose, drooping, yellow or black, over three-quarters of an inch in diameter.

Sub-species *P. domestica*, L. The Plum. Bark brown. Branches mostly without spines. Drupe oblong, drooping, black, an inch or more in diameter.

**P. LAURO-CERASUS**, L. The Common or Cherry Laurel. Bark dark green. Shoots green. Leaves evergreen, alternate, conduplicate, yellowish-green. Flowers in erect racemes, shorter than the leaves, white. Fruit a smooth, black, ovate-acute drupe. April—May. Persia, the Caucasus and the Crimea.

**PYRUS COMMUNIS**, L. The Pear. Bark rough. Branches more or less pendulous and spinous. Leaves alternate, ovate-oblong, acute, serrate, on slender stalks. Flowers white, one to one and a half inch in diameter. Fruit a turbinate pome, one to two inches long, gritty. April—May. Europe, from Ireland and Denmark to the Balkans.

Sub-species *P. Pyraster*, BOR. Leaves acuminate, downy beneath when young. Fruit obconic at the base.

Sub-species *P. Achras*, BOR. Leaves acute, slightly downy beneath. Fruit rounded at the base.

Sub-species *P. Briggsii*, SYME. Leaves cordate, nearly smooth. Fruit small, globose. Devon and Cornwall.

*NATURAL ORDER, OLEACEÆ (OLIVE FAMILY).*

**FRAXINUS EXCELSIOR**, L. The Ash. Bark smooth, olive-grey. Buds black. Leaves opposite, pinnate, of from four to seven pairs of oblong-lanceolate, serrate leaflets, each from one to three inches long. Flowers preceding the leaves, without perianths. Fruit a linear-oblong samara, notched at the apex, green, streaked with black. April—May. Europe and North Africa.

*NATURAL ORDER, EUPHORBIACEÆ (SPURGE FAMILY).*

**BUXUS SEMPERVIRENS, L.** The Box. Bark rough, grey. Branches downy when young. Leaves evergreen, sub-opposite, oblong, obtuse, not more than an inch long. Flowers monœcious, in axillary spikes, minute, whitish. Fruit a small dehiscent, horned capsule. April—May. Europe, from Belgium southward, North Africa and Asia.

*NATURAL ORDER, ULMACEÆ (ELM FAMILY).*

**ULMUS CAMPESTRIS, WITH.** The Common Elm. Bark furrowed. Suckers. Branches often long and horizontal. Leaves alternate, oblique, irregularly serrate, acute, variable in size. Flowers preceding the leaves, inconspicuous. Fruit a samara, winged all round, obovate, with the seed above its centre. March—April. Middle and Southern Europe, Siberia, and North Africa.

**U. MONTANA, SMITH.** The Wych Elm. Bark furrowed. No suckers. Branches ascending and pendulous. Leaves and flowers much as in the above. Samara sub-orbieular, with the seed below its centre, more often ripening. March—April. Europe and Siberia.

*NATURAL ORDER, JUGLANDACEÆ (WALNUT FAMILY).*

**JUGLANS REGIA, L.** The Walnut. Bark furrowed. Branches smooth, grey. Leaves pinnate, of three or four pairs of oval, acute, somewhat fleshy leaflets, and a terminal one, aromatic when bruised. Flowers monœcious. Male flowers in solitary drooping catkins on shoot of

previous year. Female flowers terminating the shoot of the year. Fruit inferior, bi-carpellary, drupaceous, oval, with nut-like endocarp and one seed. April—May. Persia.

*NATURAL ORDER, SALICINEÆ (WILLOW FAMILY).*

**POPULUS TREMULA**, L. The Aspen. Bark grey, furrowed. Branches becoming pendulous. Shoots downy, reddish. Buds slightly viscid. Leaves alternate, on very long laterally-compressed stalks, silky beneath when young; those on the suckers heart-shaped, those on the branches rounded, with incurved teeth. Flowers dioecious in dense drooping catkins without scales. Stigmas two, two-lobed, erect. March—April. Europe, North Asia, Asia Minor, and North Africa.

*NATURAL ORDER, BETULACEÆ (BIRCH FAMILY).*

**BETULA ALBA**, L. The Birch. Bark smooth, silvery-white, scaling off in transverse strips. Branches copper-brown, often weeping. Leaves alternate, deltoid or rhomboid, irregularly serrate, on long stalks. Flowers monœcious. Male catkins one to two inches long, pendulous. Female catkins sub-erect at first, their scales deciduous. Fruit minute-winged. April—May. Europe and North Asia.

Sub-species *B. verrucosa*, EHR. The White Birch. Leaves truncate at the base, acuminate, with raised veins.

Sub-species *B. glutinosa*, FRIES. Leaves cordate-acute with veins on the under surface.

**ALNUS GLUTINOSA**, GAERTN. The Alder. Bark black, with clefts. Branches when young triangular. Leaves alternate, obovate,



blunt, wavy, serrate, glutinous when young, dark. Flowers in monœcious catkins. Female catkins not an inch long, their scales woody and persistent. Fruit hardly winged. March—April. Europe, Asia, and North Africa.

*NATURAL ORDER, CORYLACEÆ (HAZEL FAMILY).*

**CORYLUS AVELLANA**, L. The Hazel. Bark split, ash-grey on stem. Shoots brown, hairy, glandular. Leaves alternate, roundish, obliquely cordate, irregularly serrate, pointed. Flowers monœcious, preceding the leaves. Male catkins one to two inches long, pendulous, Female catkins short, erect, with crimson stigmas. Fruit a nut, surrounded by a leafy involucre. February—March. Europe, Siberia, and North Africa.

GYMNOSPERMIA (CONE-BEARERS).

---

*NATURAL ORDER TAXACEÆ (YEW FAMILY).*

**TAXUS BACCATA**, L. The Yew. Bark furrowed, brown, flaking. Branches dorsiventral. Leaves evergreen, apparently distichous, linear, acute, an inch long, dark. Flowers dioecious, sessile. Male flower of peltate stamens with three to eight pollen-sacs. Ovule solitary, surrounded later by pink cup-like aril. March—April. Northern Temperate Zone.

*NATURAL ORDER PINACEÆ (FIR FAMILY).*

**PINUS PINEA**, L. The Stone Pine. Bark cracked, but smooth, reddish. Leaves evergreen, acicular, in pairs in the axils of fringed



scales, five to nine inches long, straight, semi-cylindrical. Flowers monœcious: male ones of staminal scales each with two pollen-sacs; female “cones” solitary, from five to six inches long and four inches broad, their scales having woody rhomboid terminations with four ridges from their angles and a grey pyramidal point. Seed three-quarters of an inch long, with a wing one-third as long. May—June. The Mediterranean region.

**PICEA EXCELSA**, LAM. The Spruce. Bark thin, warty, reddish-brown. Branches whorled, spreading, dorsi-ventral. Leaves evergreen, quadrangular, acicular, acute, slightly curved, stiff, less than an inch long. Flowers monœcious: male ones yellowish, cylindrical, an inch long; female cones terminating upper branches, at first erect, then pendulous and falling whole, five to seven inches long and an inch and a half broad, their scales thin, incurved and notched, bright brown. Seed small with wing three-quarters of an inch long and a third as broad. May—June. Northern Europe.

**CEDRUS LIBANI**, BARR. The Cedar of Lebanon. Bark brown, scaly. Branches horizontal, dorsi-ventral. Leaves evergreen, fasciculate, dark, glaucous when young. Flowers monœcious: male ones reddish, erect catkins two inches long, of stamens with two pollen-sacs each; female cones erect, ovate, abrupt, from three to five inches long, of broad, thin, brown scales, exuding resin. Seeds broadly winged. May—June. Lebanon.

**CUPRESSUS SEMPERVIRENS**, L. The Cypress. Bark scaly, reddish-brown. Branches ascending. Shoots quadrangular. Leaves minute, evergreen, acicular on main stem, broader and adpressed

in four rows on the shoots. Flowers monœcious: male ones minute yellowish terminal catkins, of scales each bearing three pollen-sacs; female cones globose of a few polygonal scales which have a central point and become woody. Seeds not winged. May—June. Persia, Asia Minor, and the Eastern Mediterranean region.



# FAMILIAR TREES.

---

## THE BIRCH.

(*Betula alba*, L.)

---



IF the Oak and the Beech contend for the rank of king, there is no doubt as to the right of the Birch, clad as she is in cloth of silver, adorned with emeralds, or with “patines of pure gold,” to the title of queen of the woods. Often has this tree roused the enthusiasm of both the artist and the writer; but, useful as it has been in other ages, and as it still is in other lands, it is now mainly for its æsthetic value as part of some of our most beautiful landscapes that we treasure it.

The very name Birch, in its identity with “bark,” “barque,” or “barge,” sug-

gests the time when its silver rind formed the canoes of

our early British ancestors, such as have been found buried in the gravels of the banks of the Clyde. This etymology does not seem, however, to have suggested itself to Turner, since in his "Names of Herbes" (1548) he simply says:—"Betula—or, as some wryte it, betulla—is called in greeke, Semida; in englishe, a birch tree, or a birke tree; in duche, ein birck baum; in frenche, bouleau or beula. It groweth in woddes and forestes."

The genus *Betula*, to which the Birch belongs, includes some five-and-twenty species of shrubs and trees of medium size, confined to the northern hemisphere, and remarkable for their extension into Arctic latitudes. The Canoe, or Paper Birch (*B. papyracea*), of North America, is a variety of the White Birch, though stunted, and only occurring in an isolated manner within the Arctic Circle, reaching 70° N. lat., whilst another species (*B. Bhojputtra*) grows at an altitude of 9,000 feet in the Himalayas. Our own species, *Betula alba*, ascends to 2,500 feet in the Highlands, and is widely spread over Europe, Asia, and America, extending farther north than any other European tree, but only constituting an essential element of forest scenery as far south as 45°. Together with the Alders, of which there are some fourteen species, the Birches form the natural order *Betulaceæ*, catkin-bearing trees, with not more than five stamens to each flower, and with neither "perianth" nor "cupule" (like those of Oaks, Hazels, Chestnut, or Beech) to enclose their small compressed fruits. The Birches differ from the Alders in the scales of the seed-bearing catkin being chaff-like, and falling together with its winged fruits, whilst those of the Alders remain as a woody cone.

The White or Silver Birch is a short-lived tree, as a rule from forty to fifty feet high, though exceptionally growing



to eighty feet, with a trunk seldom exceeding a foot in diameter, conspicuous from its flaking, silvery-white bark. This flaking is produced by the formation of alternate layers of larger and smaller cells in the "periderm," or outer bark, of which the larger are the more readily ruptured under the influence of variations in the degree of atmospheric moisture. Every careful observer will have noticed that this polished silver rind is interrupted at frequent intervals by transverse ridges of a darker colour extending partly round the stem. These are the "lenticels," or breathing-pores of the bark, replacing the "stomata" of the young epidermis, and corresponding to the holes filled with powdery dried cells that extend through the cork of the Oak at right angles to its surface. As the stem or branch increases in diameter, these lenticels become stretched from mere spots into long lines.

It is when its slightly crooked stem stands alone on the slope of some river glen, brown with fallen leaves of autumn, and lit up by the varying hue of the dead fronds of bracken, with its round slender branches, of polished purple bronze, weeping in festoons eight or ten feet long, as we see it in Mr. McWhirter's pictures, that the Birch is seen in all its beauty of outline. It is, however, when these bare boughs, or those of the smaller trees that dot the heathery wastes of Epping Forest or Bagshot Heath, begin to clothe themselves in April with their transparent foliage of fluttering brilliant leaflets, that the tree is, perhaps, at its perfection of grace and loveliness. When grouped together in numbers, a grove of young Birches in winter presents an almost smoke-like hazy effect of copper boughs and purple twigs springing round the slender silver stems; but in spring they lose all signs of sombre

melancholy, and seem to laugh as their leaves dance in the sunbeams which fall between them on to the dog-violets that strew the wood-side.

Linnæus's species, *Betula alba*, includes several fairly distinct forms. Of these, *B. verrucosa*, Ehrh., is distinguished by its longer pendulous branches having white resinous tubercles on their bark, as also occasionally on the leaves, by its conical buds, by the reflexed sickle-shaped side-lobes of the scales of the fruiting catkins, and by the leaf. This is rhomboidally triangular, its long stalk passing abruptly into the blade, its veins projecting from the upper surface of the blade, and its point abruptly "acuminate," or tapering. *B. glutinosa*, Fries., on the other hand, is often a mere shrub; its buds are egg-shaped, the side lobes of the scales of its fruiting catkins are erect, and its leaf is rounded, or even heart-shaped, at the base, and has its veins projecting from the under surface, and its point acute, but not drawn out. The northern form of this last, known as *B. pubescens*, Ehrh., differs mainly in the absence of tubercles and in the downiness of the leaves, peduncles, and twigs. In all the forms the branches succeed one another in what is termed a "cymose" manner, each axis being comparatively short; and the somewhat thick leaves on slender stalks, with broad "stipules" at the base and doubly-toothed margins, appear before the maturity of the catkins. This takes place in April and May, but even in February the pollen-bearing catkins may be seen forming on the twigs. These "male" catkins are borne at the ends of the shoots of the previous year, and are not protected with any winter bud-scales, whilst the "female," or fruiting catkins, terminate lateral dwarf shoots, which bear a few leaves, and are enclosed by bud-



*Chatons et feuilles  
du Bouleau.*

CATKINS AND LEAVES OF  
THE BIRCH.

Kätzchen und Blätter  
der Birke.



the Bireh yields beverages of both these classes : the wine just mentioned, and a tea prepared from the leaves, chiefly by the Finlanders. The bark, moreover, contains enough starch to furnish, when bruised, a bread-stuff to the Samoi-edes and Kamtsehadales. It is also still used in the north for roofing, being very durable and impermeable, and in Russia for the manufacture of jars, boxes, and shoes, and for tanning. On distillation, it yields a fragrant oil, which gives its pleasant odour to Russian leather. The wood, though not durable, is valued in Russia, where the Birch forms the chief tree in vast forest areas, not only as fire-wood and as a source of charcoal, but also, on account of its toughness and tenacity, for carriage-building, furniture, and turnery. A very extensive domestic industry in that country is the manufacture of wooden spoons : thirty millions, mostly of birch-wood, being made annually. The flexible branches are largely utilised in the making of brooms, and it is stated that the "faseses" carried by the "lictors" before the magistrates of ancient Rome were made up of bireh-rods. We may doubt the exact truth of the statement made by M. Alphonse Karr, in his charming "Tour autour de mon Jardin," that "in London they make champagne from" the Bireh ; but no school-boy will probably dispute the truth of his further statement, that "the most virtuous uses to which it is applied are brooms and wooden shoes." Nevertheless, Dr. Turner, the pugnacious Dean of Wells, is of a different opinion ; for in his "Herball" (1568) he writes of it : "I have not red of any vertue it hath in physick ; howbeit, it serveth for many good uses, and for none better than for betynge of stubborn boys, that either lye or will not learn." This, too, is the only connection in which Shakespeare



refers to this beautiful tree. In "Measure for Measure," he tells how fond fathers,

" Having bound up the threatening twigs of Birch,  
Only to stick it in their children's sight  
For terror, not to use, in time the rod  
Becomes more mocked than feared."

Owing to the beautiful arrangement of the cells in the outer bark, to which reference has already been made, the Birch is constantly shedding its rind in strips that go right round the stem, and is thus, together with the similarly constituted Plane, one of the species best fitted to withstand the smoke of London.

This tree is, however, peculiarly liable to the disease known as "Witch Knots," or "Witches' Brooms," a confused mass of short twigs, like an old rook's nest, produced by a very minute gall-mite, *Phytoptus*, which attacks the young buds. It is desirable to burn all parts so affected, as the mites will otherwise be carried from tree to tree by wind or birds.

The Birch is remarkable for its power of holding its own, and spreading, amongst heather, where other species are commonly stifled unless protected. Thus, formerly it was not a common tree in Epping Forest, but, from this power and its enormous production of seeds, which are scattered far and wide by the wind, owing to the little wing attached to them, it is now spreading rapidly, springing up spontaneously wherever the soil is dry, if a clearing has been made by fire or felling. Allied species in North America have been noticed as having the same faculty—as being, in fact, well equipped for the battle for life.

Whether in a Highland glen, or a London square, or on some heathy tract of southern England, the silver stem, the

lightness of the drooping outline, and the transparent foliage render the Birch a most beautiful tree, even when at midsummer the individual leaves have become coarser, and have lost the clearness of their early colouring. It is a tree that frequently keeps its greenness rather late into the autumn, not changing colour until that after-glow that so often follows the ravages of the early October gales. Then perchance against a background of dark Scotch pines, or the rich browns of the fading Oak or Beech, the little leaflets of the Birch stand out in a relief of pale straw or of pure gold, rendering still more marked the contrast of the white trunks that in an autumn twilight have a most ghostly appearance.

The Birch will grow in moist situations, but requires good drainage, and so seems to flourish best on light soils. In planting it, probably it will be best in any case to secure some dark evergreen background or contrast, effective both in spring and autumn, such as Scotch firs.





*Robinier*

ACACIA.

*Robinie.*





## THE ACACIA.

*Robinia pseud-Acacia, L.*



FEW exotic trees have been so much discussed, or have undergone such vicissitudes of popularity and neglect as has the species which is now commonly known in England as the Acacia (*Robinia pseud-Acacia, L.*).

Originally a native of North America, its seed is said to have been first introduced into Europe either, in 1601, by Jean Robin, herbalist to Henri IV., whose “*Histoire des Plantes*” was published in 1620, or by his son Vespasian, who grew it in the *Jardin des Plantes* in 1635. Parkinson, in his “*Theatrum Botanicum*”

(1640), speaks of it as grown “to an exceeding height” by the elder Tradescant at Lambeth, he having possibly

received it direct from Virginia, through his son. This tree was still standing when Sir William Watson examined the remains of Tradescant's garden in 1749. Evelyn, in his "Sylva" (1664), says of it: "By reason of its brittle nature, it does not well resist . . . our high winds; and the roots, which insinuate and run like liquorice under ground, are apt to emaciate the soil, and, therefore, haply not so commendable in our gardens as they would be agreeable for variety of walks and shade. They thrive well in His Majesty's new plantation in St. James's Park." These particular trees were, however, felled before the year 1712. John Ray, the contemporary of Evelyn, mentions the species as growing in Bishop Compton's garden at Fulham; whilst by 1731, as recorded by Philip Miller in his "Gardener's Dictionary," it had become common, and was known as ripening seed in Great Britain.

It had long been valued as a timber tree in the United States, and in Virginia and New England was used for treenails in shipbuilding, being hard, strong, inelastic, and durable. Much attention was directed to it in Europe for this and other purposes in 1762, in 1786, and at subsequent dates. It was described as suitable for axletrees, cogs, or wedges, as being a good fuel, and even as capable of cultivation as green forage for cattle; and in 1791 a Mr. Ebenezer Jessup proposed in the *Gentleman's Magazine* that ten thousand acres in the New Forest and Forest of Dean should be planted with this tree for the purposes of the navy, stating that he knew posts made of its wood to last from 80 to 100 years.

William Cobbett, while farming on Long Island, between 1817 and 1819, was struck with its utility, and on his return to England brought home some of its seed,

which, from 1823, he cultivated on an enormous scale at Kensington and Barnes. He wrote of the tree in terms of the most extravagant eulogy, styling it the "tree of trees," and prophesying that it was destined to speedily replace most of the hard-wood trees in cultivation. Ignoring the fact that the *Robinia* was already well known in England under the name "Acacia," not only to botanists but also to nurserymen, he popularised the American name "Locust," and obtained so large a sale for it, though at a price more than six times its ordinary market value, that he not only imported the seed by tons, but even bought up plants raised from English seed to sell again at fancy prices.

Confused in the 17th century with the Acacias of Egypt and Arabia, which it resembles mainly in foliage and fruit, and by the American colonists with the Carob-bean, Locust, or St. John's-bread, of South Europe (*Ceratonia siliqua*), whence its French name, "Carouge des Américains," this tree was named by Linnæus after its introducer, and in reference to this confusion, *Robinia pseud-Acacia*, the Robinia, or False Acacia.

All three trees belong to the great family *Leguminosæ*, the Pea and Bean tribe; but the pea-shaped blossoms of the *Robinia*, which are generally white, as distinguished from the small, many-stamened, yellow, bottle-brushlike flowers of the true *Acacia*, have given to the former the popular names of White Acacia, or "Acacia blanc."

*Robinia* is allied to the Restharrows (*Ononis*), and to the Brooms and Laburnums (*Cytisus*), belonging with them to the section *Loteæ* of the sub-order *Papilionaceæ*. The members of this sub-order take their name from the supposed resemblance of their pea-like blossoms to a butterfly, and are further characterised by having ten stamens in

each flower. In the section *Loteæ* the pod-like fruit or "legume," which gives its name to the whole order, is not divided up into joints; and the seed is occupied by an embryo, or young plant, the primary rootlet, or "radicle," of which rests against the edges of its two leaves, or "cotyledons," whilst these cotyledons are themselves flat, and in the process of sprouting or germination rise above ground as the two first foliage-leaves of the plant. In this last respect the seed resembles that of a bean more than that of a pea, in which the cotyledons, remaining within the seed, act merely as storehouses of reserve nutriment, and the next pair of leaves produced are the first to rise above ground.

The genus *Robinia* is distinguished by its pods being flat and being furnished with a projecting flange externally along that margin to which the seeds are attached internally—the margin termed "ventral"—and also by its leaves being made up of several pairs of leaflets with an odd terminal one. The distinctive characteristics of the species known as the False Acacia are its scented flowers, generally white, and hanging in a loose raceme or cluster, like that of the Laburnum, the egg-shaped leaflets, and the pair of prickles at the base of each leaf representing the "stipules." These appendages are very variable in different plants, being often absent altogether or but small and fugacious, represented by large leaf-like structures as in the Pea, or performing the entire function of the leaves, as in some Vetches.

In some of the true Acacias they are also thorns, but are hollowed out so as to furnish lodgings for tribes of ants, which protect the shrub from other species of the same group of insects who would despoil it of its leaves; but the





*Fleurs et feuilles du  
Robinier.*

ACACIA, FLOWER AND  
FOLIAGE.

Robinien-Blüthe und  
Blätter.



function of the solid prickles in the False Acacia is not so obvious—not, at least, when the tree is fully grown. From these prickles and its pod-like fruits this species derives its German name, “Schotendorn.”

This tree can be raised either from seed, from cuttings, or by grafting; it will grow in any soil that is not too wet, and is a quick-growing but short-lived plant; but the quality of its timber undoubtedly varies according to the character of the soil in which it is grown. It may reach a height of seventy or eighty feet, with a diameter of two, three, or, in Kentucky, as much as four feet; and even in the neighbourhood of London it has been known to reach forty feet within ten years, sometimes making shoots eight or ten feet long in a single season.

The wood of the best varieties, when well grown, is hard, strong, and durable, takes a good polish, and is prettily veined with brown. Besides its use in ship-building and for agricultural purposes, it is employed in America for the sills of doors and windows, for cabinet work, and in the making of toys. When quite dry it weighs forty-eight pounds per cubic foot, being, in fact, heavier, harder, stronger, tougher, more rigid, and more elastic than English Oak. Speaking absolutely, however, it is an inelastic wood, to which quality, coupled with its hardness, it owes its value for treenails. Acacia wood is somewhat twisted in its growth, and liable to crack, while the branches break off in a brittle, splintery manner. It must, moreover, be noted that the good qualities ascribed to this timber belong only to the variety known in America as the Red Locust.

The species has a latitudinal range from Canada to Carolina, and is very variable, especially when grown from

seed, no less than sixteen varieties being described by Loudon. Some of these may be geographical races. Among them is one with yellow flowers, three destitute of prickles, and others with the leaves curled or with nearly erect or very pendulous branches; but the most important distinctions are those based on the colour of the wood, which may be only the result of differences in soil and climate. Of these there are three varieties recognised in the United States: the Red Locust, with red heart-wood, the most beautiful and durable timber of the three; the Green Locust, with a greenish-yellow centre, which is the commonest; and the White Locust, which is the least valuable. It is stated that a post made of Red Locust will outlast two made of the White.

The bark remains smooth for ten or fifteen years, but then becomes longitudinally furrowed—in old trees to a considerable depth. The branches rise slightly when first springing from the nearly cylindrical main stem, but then spread out horizontally, giving off an abundance of secondary branches, which take a similar direction.

The leaves consist of from four to nine pairs of egg-shaped leaflets and a terminal one, in all eight, nine, or twelve inches long, the individual leaflets often exceeding an inch in length. Their late appearance and early fall is one of the chief drawbacks to the planting of the tree for ornamental purposes; but they have the countervailing advantage of being so smooth that the least shower cleans them of what little dirt can adhere to them, so that in the metropolis, or other large towns, they appear fresh and verdant in July and August, when most other foliage has become dull and soot-begrimed. The leaflets, like those of so many of the *Leguminosæ*, close at night or in wet



weather in what is termed "sleep," being then folded in a vertical plane, as when in the bud.

It is not to be supposed that much folk-lore should be associated with a tree of such recent introduction into Europe as the Acacia; but it is in connection with its clusters of pure white blossoms that this tree enters into the symbolism of the aborigines of its native land. The North-American Indian presents a blossoming branch of the Acacia to the lady of his choice as a declaration of his love. The botanist describes these blossoms as consisting of five sepals, five petals, ten stamens, and a single carpel. Of the five small green sepals, two at the back of the flower, *i.e.*, nearest to the main stalk of the inflorescence, support the large, upright petal known as the "vexillum," or standard. At the sides are the smaller wings, and below are the remaining two petals, which in their partial union suggest the keel of a boat, and are, therefore, known technically by that name. This arrangement of the petals, which are elaborately moulded over one another at their bases, and that of the ten stamens—the nine lower ones united into a tubular investment to the ovary, while the uppermost one is unattached—is, no doubt, connected, as is the honey and the perfume, with the visits of insects, to secure at least an occasional cross-pollination. In San Domingo an excellent liqueur is prepared from the blossoms. The flowers are succeeded by pods, about three inches long, each containing from five to six brownish-black seeds, which ripen readily.

The tree has but few enemies in Great Britain, though in America its timber sometimes suffers from the ravages of a larva (*Cossus robiniaæ*) allied to the goat-moth. Hares and rabbits devour the bark when young, and cattle



are fond of the leaves, which they manage to eat, when within reach, in spite of the prickly stipules. The *Acacia* will not, however, serve as a cover for game, being intolerant either of shade or of the drip of other trees. Its moist, quick-growing sap-wood and succulent foliage, however, have caused the *Acacia* to be strongly recommended for the planting of railway embankments in forest areas, so as to intercept the sparks before they can spread to more inflammable timber-trees, such as the firs.

We have many fine specimens in England, especially at Syon House, Claremont, and Goodwood, whilst Loudon mentions one at Niddrie Mareschal, near Edinburgh, four feet in diameter at the base of its stem.

Though it becomes straggling from a habit of dying piecemeal when by no means an old tree, the airy lightness of its sprays of pure green foliage certainly renders the *Acacia* one of the most desirable of our town trees.





*Laurier Cerisier.*

LAUREL.

*Kirsch-Lorbeer.*





## THE COMMON OR CHERRY LAUREL.

(*Prunus laurocerasus*, L.)

*Laurier Cerisier. Kirsche Lorbeer.*



POPULAR names and their suggestiveness of error cannot be better illustrated than by the consideration of the trees known as Laurels. The name is said to be connected with the Latin word *laus*, “praise;” but the origin of the associations of the name is Greek. Apollo having slain the Python, the ancient serpent, formed from the slime left after Deucalion’s flood, fled for purification to the laurel-groves of the vale of Tempe. Here he became enamoured of the nymph Daphne, the daughter of the river Peneus, and

on his pursuing her she took refuge in her paternal stream, and was metamorphosed into a laurel. Apollo,

returning to Delphi, instituted the Pythian games to commemorate his victory, and the prizes there awarded were chiefly crowns of the leaves and berries of the shrub, which henceforth was looked upon as sacred to the god—the *Laurea Delphica*, or *Apollinaris*. Apollo being the god of poetry, his emblem, that of victory and clemency, became the favourite of the poets, and hence of scholars generally, so that successful graduates of universities or other learned men became known as “laureates,” or “baccalaurei,” from the berried crown. Such graduates, like the fellows of colleges down to our own time, were not allowed to marry, lest the duties of husband and father should take them from their literary pursuits, and hence the term “bachelor” became extended to unmarried men in general.

The Laurel was also believed to be a protection against lightning; and accordingly, the Emperor Tiberius, when it thundered, wore a laurel-wreath made from the tree, at the imperial villa on the Flaminian Way, which sprang from a shoot said to have been miraculously sent from heaven to Livia Drusilla. Used as an emblem of truce, like the olive, both trees were equally forbidden to be put to any profane uses; but the crackling of burning laurel-leaves was also employed as a means of divination.

Dr. Lindley argued that the true Delphic Laurel was *Ruscus racemosus*, sometimes called the “Alexandrian Laurel,” a low-growing, berry-bearing shrub, with glossy green leaf-like branches, akin to our English Butcher’s-broom; but it is more generally considered that the Daphne of the Greeks was our Bay-tree (*Laurus nobilis*), fine trees of which now adorn the banks of the Peneus. This, no doubt, was Chaucer’s



“ Fresh grene laurer tree,  
That gave so passing a delicious smelle,”

and was the only laurel generally known in Europe in Shakespeare's time. Its popular name has now, however, been completely transferred to a totally different and unrelated plant, the “Cherry Bay,” or “Cherry Laurel” (*Prunus laurocerasus*, L.). There is little in common between the two plants beyond the evergreen character of their leaves.

Belonging to the natural order *Rosaceæ*, the Cherry Laurel was referred by Linnæus to the genus *Prunus*, and is retained in that position by Bentham and Hooker. The genus *Prunus* is characterised by its fruit being a “drupe” —a succulent fruit, formed from one carpel, with a strong inner layer, or “endocarp,” and containing two pendulous ovules, only one of which commonly matures into a seed. The calyx falls off with the petals. The Cherry Laurel differs from the Plums, and agrees with the Cherries, in the absence of “bloom” from the surface of the fruit; but, together with the Bird-cherry (*Prunus padus*) and the Portugal Laurel (*P. lusitanica*), it constitutes a distinct sub-genus (*Laurocerasus*), characterised by having “conduplicate” leaves and “racemes” of flowers, which appear after the leaves, whilst the rest of the genus have their flowers either solitary or in “fascicles.” A “fascicle” is a tuft of flowers whose stalks spring nearly from one point, whilst a “raceme” has an elongated main stalk, or peduncle, giving off successive lateral “pedicels,” or flower-stalks.

The Cherry Laurel is exceptional among its congeners in having green shoots, and the yellowish-green tint of its leathery evergreen leaves is also characteristic. They somewhat resemble those of the Orange or of the Magnolia.

They are "ovate-lanceolate" in outline, are provided with a few scattered teeth along their margins, and (like those of many allied "drupaceous," or "stone-fruit" trees) have from two to four glands on their under surfaces. The "racemes" are shorter than the leaves, and the fruits are "ovate-acute" in outline.

The species is one of rapid growth, increasing from one to three feet in height in a single year; but with us it is somewhat more susceptible to the action of frost than its congener, the Portugal Laurel (*Prunus lusitanica*). Its long racemes of small white flowers are produced after the young leaves, during April or May; and the fruit, which is green at first, ripens to a pure black by October. This fruit, though insipid, is perfectly harmless.

The Cherry Laurel is wild in sub-alpine woods in Persia, the Caucasus, and the Crimea, and was first introduced into Europe by Clusius in 1576. He received it from David Ungnad, who was at that time ambassador of the Emperor, at Constantinople, and it is related that all the plants sent home by Ungnad to Vienna perished with the exception of one Horse-chestnut and one Laurel, the latter tree being then known as "Tràbison curmàsi," the "Trebizonde Date, or Plum." Clusius's plant died without flowering; but a cutting from it flowered in 1583. The earliest mention of the plant in England is in "Paradisi in sole Paradisus Terrestris; or, a Garden of all Sorts of Pleasant Flowers, which our English Ayre will admitt to be noursed up: By John Parkinson, Apothecary of London" (1629). It is as follows:—

"Laurocerasus. The Bay Cherry. This beautiful Bay, in his naturall place of growing, groweth to be a tree of a reasonable bignesse and height, and oftentimes with us also, if it be pruned from the lower branches;



*les et baies du  
rier Cerisier*

LAUREL, FOLIAGE AND  
BERRIES.

*Kirsch-Vorbeer Blätter  
und Beeren.*





but more usually in these colder countries it groweth as a shrub or hedge bush, shooting forth many branches, whereof the greater and lower are covered with a dark grayish green barke, but the young ones are very green, whereon are set many goodly, fair, large, thick and long leaves, a little dented about the edges, of a more excellent, fresh shining green colour, and far larger than any Bay leaf, and compared by many to the leaves of the Pomecitron tree (which, because we have none in our countrey, cannot be so well known) both for colour and largenesse, which yeeld a most gracefull aspect; it beareth long stalkes of whitish flowers, at the joynts of the leaves, both along the branches and towards the ends of them also, like unto the Birds Cherry or Padus Theophrasti, which the Frenchmen call Putier and Cerisier blanc, but larger and greater, consisting of five leaves with many threds in the middle; after which cometh the fruit or berries, as large or great as Flanders Cherries, many growing together one by another on a long stalke, as the flowers did, which are very black and shining on the outside, with a little point at the end, and reasonable sweet in taste, wherein is contained a hard, round stone, very like unto a cherry stone, as I have observed as well by those I receeived out of Italy, as by them I had of Master James Cole, a merchant of London lately deceased, which grew at his house in Highgate, where there is a fair tree which he defended from the bitterness of the weather in winter by casting a blanket over the top thereof every year. . . . I had a plant hereof by the friendly gift of Master James Cole, the merchant before remembred, a great lover of all rarities, who had it growing with him at his countrey house in Highgate aforesaid, where it hath flowred divers times, and born ripe fruit also. . . . Daleehampius thinketh it to be Lotus Aphricana, but Clusius refuteth it. Those stones or kernels that were sent me out of Italy came by the name of *Laurus Regia*, The King's Bay."

In the appendix to Johnson's edition of Gerard's Herball (1633) is a similar description, illustrated by two very fair woodcuts. The bark is described as "swart green," and the leaves as "snipt lightly about the edges;" and it is added that—

"It is now got into many of our choice English gardens, where it is well respected for the beauty of the leaves, and their lasting or continuall greennesse. The fruit hereof is good to be eaten, but what physicall vertues the tree or leaves thereof have it is not yett knowne."



In the first edition of his "*Sylva*," (1664) Evelyn speaks of it as :—

"Resembling (for the first twenty years) the most beautiful-headed orange in shape and verdure, and arriving in time to emulate even some of our lusty timber-trees ; so as I dare pronounce it to be one of the most proper and ornamental trees for walks and avenues of any growing." "The leaves," he continues, "boiled in milk, impart a very grateful taste of the Almond ; and of the berries, or cherries rather (which poultry generally feed on), is made a wine, to some not unpleasant. . . and of the wood are said to be made the best plough-handles."

He then relates, with doubts of his own as to the tree's having come more probably "from some colder clime," the not improbable story that the Laurel was introduced "from Civita Vecchia in 1614, by the Countess of Arundel, wife to that illustrious patron of arts and antiquities, Thomas, Earl of Arundel and Surrey." The Countess certainly did return from Italy in that year, which would be consistent with Parkinson's possession of the shrub prior to 1629, and there are still a number of very old laurels at Wardour Castle, the family-seat.

Ray, in 1688, in his "*Historia Plantarum*," speaks of the Laurel as being then very common in gardens and shrubberies, and remarkably hardy and quick in growth, braving our winters even in exposed situations ; but, on account of its thick and woody branches, not fitted for the close-clipt "*topiary-work*," then so much in fashion. We may, perhaps, attribute to the introduction of the Laurel, and the naturally rapid increase in the popularity of its bright foliage, the victory of a more natural and less formal style of gardening over the Dutch taste for mazes, alleys, peacocks, and tea-pots in yew or box.

Philip Miller, in that store-house of the botanical and horticultural knowledge of his time, the "*Gardeners' Dic-*

tionary" (Sixth Edition, 1752), speaks of the Laurel as being susceptible to frost if "pruned up, in order to form them into stems," and recommends as preferable the massing or clumping of many plants together, as then first carried out by the Duke of Bedford at Woburn Abbey. He also mentions that near Paris, where it is not as hardy as with us, it was grafted on the cherry or plum—a practice which has, he says, but little, if anything, to recommend it; and he also states that—

"The Berries have long been used to put into Brandy, to make a sort of Ratafia, and the Leaves have also been put into Custards."

The infusion of the leaves, known as laurel-water, seems first to have been recognised as "one of the most speedy and deadly poisons in Nature," about the year 1731, by the Abbé Fontana, whose experiments are described in the 70th volume of the Royal Society's "Philosophical Transactions"; but it was the murder of Sir Theodosius Boughton by his brother-in-law, Captain Donaldson, by means of it, in 1780, that first directed general attention to it; and it was not until 1802 that Schrader identified the results of the distillation of the leaves as oil of bitter almonds and prussic acid. Though a few crumpled leaves may produce sneezing, and will rapidly prove fatal from their fumes to moths and butterflies, they may, like peach-kernels, be used in small quantities for flavouring with impunity.

The Laurel certainly flourishes best in sheltered situations, and in a deep and rather light soil. It is invaluable as underwood, relieving the monotony of the bare stems of timber trees. When so grown it requires to be periodically cut back or pegged down, or its stems become naked below. A laurel-bush may frequently be seen from

twenty to thirty feet high, and with stems considerably over a foot in diameter; but perhaps the largest in the world are those, described by Loudon in 1835, at Minward, in Argyllshire, and at Shelton Abbey. Of these, the former was then 31 feet high, 6 feet 9 inches in the diameter of the trunk, and 176 feet in the circumference of the head, whilst the latter, then ninety years old, was 45 feet high, 6 feet in the diameter of its trunk, and nearly 320 feet in the circumference of its head!







*Orme champêtre.*

COMMON ELM.

*Feldrüster.*

Its tufts of small flowers, often conspicuous with red or purple anthers on the bare boughs in the middle of leafless March, succeeded by the clusters of pale green "samaras," as the botanists term the flat-winged fruits, might well make us lay the blame of the absence of ripe seed on our climate, as being unnatural to the Elm. It is, however, no exceptional circumstance that this species should not ripen its seed in England, for it seldom does so in any part of Europe or Asia, though the numerous seedling varieties that have been raised by our nurserymen bear witness to the fact that it does occasionally ripen a few seeds.

Native or not native, the "hedge-row Elms" now form a leading feature in most of our southern and midland landscapes, in the avenues of our parks, or scattered over them in clumps; stripped of their lower boughs on the margins of our corn-fields; clipped close so as to contribute to the hedge itself; or in the venerable grandeur of unmolested beauty, as the historic tree on some village green.

The Elms, with three or four other genera, are separated off from the great group of catkin-bearing forest trees to form a distinct natural order, the *Ulmaceæ*. They are confined to the north temperate zone, and of the genus *Ulmus* there are rather more than a dozen forms admitted to rank as species. These agree in having their leaves "oblique," *i.e.*, unequally lobed at the base, one side being larger than the other; in their tufted flowers, which are not in drooping catkins, each containing both stamens and pistils; and in the enclosed ovary having two chambers, though the winged fruit which results therefrom has commonly only one chamber with one seed in it. The position of this seed-chamber in the elliptical



fruit furnishes the distinguishing characters of our British Elms: in the Common Elm (*Ulmus campestris*) it is above the centre, and near to the little notch at the top of the samara; whilst in the Wych Elm (*U. montana*) it is below the centre. When, however, instead of poring over dried specimens in the herbarium, we visit the living tree, we see at once many other features that clearly impress us with the individuality of several different forms.

When seen at its best the Elm is a very large tree, even exceeding 120 feet in height, and 40 or 50 feet in girth, though seldom over 100 feet high or 30 feet round; often sending out one or two huge horizontal limbs to a distance of thirty or forty feet from the trunk, and generally forking above into ascending branches, whose multitudinous branchlets and twigs form a rounded top, towering over the green billowy masses that spring from the limbs. Its bark is corky, grey in colour, and scored by those grand vertical furrows of age that mark the expanding rings of wood within, and have earned for the tree the epithet of "rugged." When bare of leaves, and standing black against a dull wintry sky, the tiny twiglets on the topmost boughs appear as delicate lace-work, far exceeding in fineness the minutest ornament of the Gothic architect, and yet graduating downwards into mighty beams, so as to suggest at once the strength of Nature's framework and the delicacy of her finish.

Amidst the fall of the early capsules in April the leaves unfold, first on one spray, waving near the summit, and then within a day or two over the whole tree; so that a veteran, perchance some three centuries in age, appears

before us in a clear green robe, suggestive in its delicacy of perpetual youth. The 18th of April has been termed *Ulmifrondes*, for then, in the south of England, the tree is generally in full foliage. In May its leaves have assumed a darker, duller hue, and but for its charms of outline, the Elm would be a heavy, monotonous item in the landscape. When, in August and September, other trees are changing hue on every side, emulating in the hectic and garish gaiety of decay the brilliancy of spring, the Elm retains its sombre green, and not until the gales of the equinox have stripped its neighbours bare to the blast does it commence that after-glow of colour that marks a fine October, one bough becoming a bright golden yellow, and then, while the others follow its example, dying to a pure brown.

The Common Elm is most abundant to the south of the Trent, and in this district almost every neighbourhood has its famous old Elm, celebrated for age and size, beside a roadside inn, or associated with the good Queen Bess or some other historic character. In the home-meadow of an old English grange the row of Elms will generally be clamorous with the hoarse voices of rooks, who are seen in spring deftly arranging the dead twigs of winter to form those homes which, when deserted, wave among the bare branches like blotches upon the sky. The Elm is not particular as to soil, but flourishes best in a deep clayey loam in sheltered valleys. In sand or gravel its roots spread horizontally near the surface of the ground, their ends watered by the drippings from its long limbs, and they are thus liable, not only to be laid bare by the removal of the surface soil through the action of the rain—for which, covering themselves with a thick corky



*s. fruits, et feuilles  
de l'Orme*

FLOWERS, FRUIT, AND LEAVES  
OF THE ELM.

Blüthe, Frucht und Blätter  
der Ulster.





rind, they care little—but also to cause, through their loose hold in the earth, the overthrow of the whole tree. Another misfortune to which the Elm is peculiarly liable is the loss of its large horizontal limbs, which, though sometimes attributable to the action of frost, seems often only to be accounted for by supposing that they have elongated themselves, regardless of gravitation, beyond the cohesive power of their woody tissue; unless, indeed, we adopt the squirrel's explanation in Mr. Jefferies' charming fable, "Wood Magic":

"Elms are very treacherous, and I recommend you to have nothing to do with them, dear."

"But how could he hurt me?" said Bevis.

"He can wait till you go under him," said the squirrel, "and then drop that big bough on you. He has had that bough waiting to drop on somebody for quite ten years. Just look up and see how thick it is, and heavy; why, it would smash a man out flat. Now, the reason the Elms are so dangerous is because they will wait so long till somebody passes. Trees can do a great deal, I can tell you: why, I have known a tree, when it could not drop a bough, fall down altogether when there was not a breath of wind nor any lightning, just to kill a cow or a sheep out of sheer bad temper."

The stems of old Elms often become distorted with huge wart-like swellings, that put out tufts of little leafy twigs, especially when branches have been removed by man or nature. The wood of these swellings is ornamentally mottled, and takes a better polish than the ordinary timber of the tree, and is therefore valued for veneering. In France the trees are sometimes lopped on purpose to produce these knots. The chief insect foes of the Elm are the caterpillar of the Goat-moth (*Cossus ligniperda*), which eats its way into the wood of this tree, as it does also into that of the Ash, Oak, Beech, Linden, Willow, Poplar, Apple, Walnut, and others, and the Elm-bark



Beetle (*Scolytus destructor*). This latter insect pierces innumerable holes through the bark, and forms extensive branching galleries in the inner bark and young wood. The remedies suggested are paring off the older bark so as to encourage a copious flow of sap, drenching the stem for several days, by means of a garden hose, and dressing it with coal-tar or soft soap, and above all, not allowing the felled trunks of infested Elms to remain on the ground with their bark on. Far more disfiguring, however, than these defects are those caused by man's ill-treatment. In many agricultural counties the Elms may be seen trimmed, to a height of forty or fifty feet, of every bough, so that they resemble nothing in nature but an aged hollyhoek or a gigantie Brussels-sprout. In this pruning the cut ends are often carelessly made, so that wet-rot and decay eat from them into the centre of the stem. Even when completely hollow, a battered veteran will long retain enough vitality in its mere shell to put forth some leaves each year.

The timber of the Elm is too useful to be thus wantonly destroyed. The whole log can be used, the lighter sap-wood being as durable as the brown heart, and when kept perfectly dry or completely under water it is peculiarly imperishable. Hollowed Elm-logs were formerly almost exclusively used for water-pipes, and the wood is still employed for ships' pumps, keels, and bilge-boards, as well as for chairs and furniture. When alternately wet and dry it decays rapidly; and thus, in the use to which the greatest quantity is now put, to form our last resting-places on earth, it soon returns our dust to that whence we were taken.

The Elm is so variable in the degree of corkiness of the

stem and branches, the smoothness or downiness of the young twigs, and the size of the leaf, whether examined in a wild state or in a nursery of seedlings, that we can hardly avoid considering *Ulmus campestris* as rather a group of allied forms than as a single species. Among the recognised varieties of this group are the Hertfordshire, Cornish, Kidbrook, Irish, and Worcestershire Elms; but the leaves of young seedlings, suckers, and mature trees are so much larger than those of the oft-cropped victims of the hedger's shears as to lead to frequent mistakes in regard to specific identity.

It is remarkable that, beyond a few casual allusions, the Elm has attracted but little attention from our poets; and to Spenser, Shakespeare, and Milton it is but "the vine-prop elm" of Virgil's Italian vineyards. On the other hand, though they refer mainly to another species, the following passages from "The Autocrat of the Breakfast Table" are too characteristic both of the tree and of the writer to be omitted.

"I want you to understand, in the first place, that I have a most intense, passionate fondness for trees in general, and have had several romantic attachments to certain trees in particular. Now, if you expect me to hold forth in a 'scientific' way about my tree-loves—to talk, for instance, of the *Ulmus Americana*, and describe the ciliated edges of its samara, and all that, you are an anserine individual, and I must refer you to a dull friend who will discourse to you of such matters. . . . Who cares how many stamens or pistils that little brown flower, which comes out before the leaf, may have to classify it by? What we want is the meaning, the character, the expression of a tree, as a kind and as an individual. . . . I shall never forget my ride and my introduction to the great Johnston Elm. I always tremble for a celebrated tree when I approach it for the first time. . . . I have often fancied the tree was afraid of me, and that a sort of shiver came over it, as over a betrothed maiden when she first stands before the unknown to whom she has been plighted. Before the measuring-tape the proudest tree of them

all quails and shrinks into itself. All those stories of four or five men stretching their arms around it and not touching each other's fingers, of one's pacing the shadow at noon and making it so many hundred feet, die upon its leafy lips in the presence of the awful ribbon which has strangled so many false pretensions. As I rode along the pleasant way, watching eagerly for the object of my journey, the rounded tops of the Elms arose from time to time at the roadside. Wherever one looked taller and fuller than the rest I asked myself—'Is this it?' But as I drew nearer they grew smaller—or it proved, perhaps, that two standing in a line had looked like one, and so deceived me. At last, all at once, when I was not thinking of it—I declare it makes my flesh creep when I think of it now—all at once I saw a great green cloud swelling in the horizon, so vast, so symmetrical, of such Olympian majesty and imperial supremacy among the lesser forest growths, that my heart stopped short, then jumped at my ribs as a hunter springs at a five-barred gate, and I felt all through me, without need of uttering the words, 'This is it!' . . . What makes a first-class Elm? Why, size in the first place, and chiefly. Anything over twenty feet of clear girth, five feet above the ground, and with a spread of branches a hundred feet across, may claim that title, according to my scale. . . . Elms of the second class, generally ranging from fourteen to eighteen feet, are comparatively common. . . . The American Elm is tall, graceful, slender-sprayed, and drooping as if from languor. The English Elm is compact, robust, holds its branches up, and carries its leaves for weeks longer than our own native tree. Is this typical of the creative force on the two sides of the ocean, or not?"







*Érable champêtre.*

FIELD MAPLE  
(AUTUMNAL FOLIAGE).

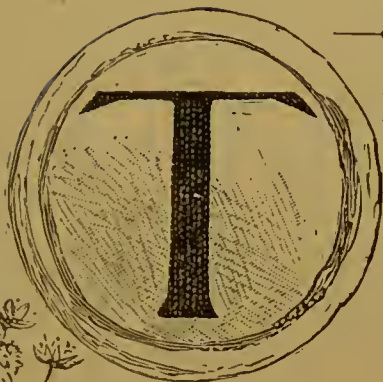
Feld=Alhorn.





## THE MAPLE.

(*Acer campestre*, L.)



THE Maple (*Acer campestre*, L.) is the only truly indigenous representative of the genus *Acer* and of the order *Sapindaceæ*. True, its congener, the Sycamore, is a very common tree, familiar to all, as is also the Horse-Chestnut, which is more distantly akin; but neither of these has been more than a few centuries in our islands, whilst the Maple is not only common, but has never been doubted to be a truly wild tree.

Though it is, perhaps, chiefly with the autumn glories of North American woodlands that we associate the beautifully varied

tints of the dying leaves of the Maples, the greater number of the fifty or sixty species of the group are

natives of Asia, and chiefly of that part of Asia which lies between Japan and the Himalayas. They are, in fact, essentially trees of the North Temperate zone; but in looking intelligently at our humble hedgerow bush—for the Maple seldom stands alone, or reaches the dimensions of a timber-tree—we should bear in mind, not only the range in space of its existing fellows, but also their interesting extinct representatives in the remote past. It has been suggested that all the floras of the world have had a northern origin, and that plants in general tend to migrate rather from north to south and from east to west than in the reverse direction. In explanation of the first of these lines of passage Darwin pointed out that as there is more land in the north the plants of those regions may have existed in greater numbers, and so have attained under competition a higher state of perfection or dominating power; but no one has yet explained the meaning of Bishop Berkeley's dictum that—

“ Westward the course of empire takes its way,”

at least in so far as it is true in the vegetable world.

Among the most ancient known assemblages of fruit-bearing—*i.e.*, “angiospermous”—plants in the world is that in the Lignites, or Brown-coal, of the Dakotah group, on the plains of eastern Kansas and Nebraska, a group apparently intermediate in geological age between our Chalk and the Thanet Sands that overlies it; and here, among many other trees, occur what are perhaps the oldest-known Maples. In rocks far more modern, and yet of immeasurable antiquity—the Miocene beds of Ceningen, in Switzerland—as many as nineteen well-marked species of Maple have been discovered, a greater number than occurs in any

one district at the present day. The plants with which they are associated have a North American "facies," or general character, and the whole of this Miocene flora is believed to have come from what is now the United States, across Asia, the greater part of it retreating along the same line in a reverse direction, at a later period, before the southerly advance of the increasing cold of the Glacial Epoch. A Tulip-tree in China, the Magnolias of Japan, and a few other stragglers, still show the line of march; and perhaps our own Maple is a relic of the same time, which has survived the cold, and in our autumn woodlands still surprises us with an exotic wealth of colour.

Some of its congeners are large trees; but the Maple is seldom more than ten or twenty feet high. In sheltered situations, however, it considerably exceeds these dimensions, trees of twenty years of age being recorded as reaching thirty-four feet in height. One at Farnham Castle, in Surrey, is recorded by Loudon, in 1835, as being thirty feet high at fifty years of age; one at Finborough Hall, Suffolk, forty feet at seventy years; one at Braystock, Essex, as fifty feet at eighty years; and one growing in stony clay at Melbury Park, Dorset, a hundred years of age and only thirty-eight feet in height, having however a trunk two feet nine inches in diameter, whilst that of its head was thirty-seven feet. The finest recorded Maple, however, is probably that at Blairlogie in Stirlingshire, growing in an exposed situation in light loam on dry gravel, which at the age of three hundred and two years had reached a height of fifty-five feet, with a diameter of four feet, and a head forty-three feet across.

The branches of the Maple spread somewhat hori-

zontally, and when growing apart from other trees it acquires a compact rounded head not unlike that of many Sycamores. The bark of the young branches is smooth, but early becomes brown, rough, and corky, splitting in longitudinal furrows, and affording a pleasing contrast to the crimson stalks of the young leaves, and to the somewhat sombre greens of the foliage.

All the Maple group have three principal veins or ribs radiating from the base of the leaf, and in most cases the blade is lobed in a correspondingly palmate manner. The leaves of our English Maple seldom much exceed two inches across, averaging only an inch and a half; but their outline is very characteristic, the five main lobes of the leaf and the clefts or "sinuses" between them being alike, whilst the base of the leaf is broad and obtusely cordate—*i.e.*, heart-shaped. They have generally a few slight notches in the margin; but are sometimes quite entire. The slender leaf-stalks, over an inch in length, are crimson, and the young leaves are downy and of a blue-green tint, which afterwards changes as they become smooth to a shade in which there is a considerable admixture of brown and yellow. In a favourable autumn they turn to the clearest lemon-yellow, not retaining a trace of green, and not decaying to the copper-brown of sodden decay until they have fallen from the tree; so that, though less varied than those of their kinsfolk the Horse-Chestnuts, they are brighter and less melancholy in their associations.

It is distinctive of our Common Maple that its inconspicuous clusters of green flowers terminate the young shoots of the same year, instead of being produced by lateral buds altogether distinct from those which develop





*Feuilles et fruits de l'Érable  
champêtre.*

FIELD MAPLE, FOLIAGE  
AND FRUIT.

Feld=Ahorn Blätter und  
Frucht.





into foliage, as is the case in many other species of the genus. These clusters stand erect, unlike those of the Sycamore, which hang downwards; and the peduncles, and even the sepals, anthers, and ovaries are downy, so as often to be seen thickly covered with dust. Inconspicuous as are both sepals and petals among the young leaves in May and June, they offer but little attraction to insects. The flowers low down in the cluster are male or staminate, the terminal ones bi-sexual, and, sometimes at least, “proterandrous”—*i.e.*, the stamens first coming to maturity; so that, though they may commonly be fertilised by the wind, or even be fertile with their own pollen, the flies that do visit them undoubtedly effect an occasional cross.

The fruit is a characteristic of the genus, the hairy ovary at an early stage in its development showing signs of the wings that are to grow from the side of either carpel; so that it forms a two-winged “samara,” like two blades of a screw paddle, with a chamber at the base of each containing one seed, though there were at first two ovules. Continental botanists have subdivided the species *Acer campestre* of Linnæus mainly according to the presence or absence of down on ripe fruit, our British variety, in which this is present, being termed *Acer molle*, or *A. campestre hebecarpum*. The varieties, however, agree in having the wings of the samara smooth, and spreading almost horizontally—in which they differ from those of the Sycamore, which are “ascending,” as they do also in size—each wing being only about half an inch in length, and of a somewhat oblong outline, and tinged with red. The function of this double-winged fruit is clearly seen when it falls whirling in the autumn breeze, wafting

the seed to some spot where it may have a good chance of growing up without exclusion from light and air by the boughs on which it formerly hung.

The wood of the maple is excellent as fuel, and can be made into charcoal of the best quality ; but being compact, fine-grained, and often beautifully veined, besides taking an excellent polish, it is chiefly in demand for ornamental purposes. Tables made of this wood were much prized among the ancient Romans, and veneers and various turned articles are still made from it, especially in France. The wood of the roots is frequently full of knots ; and mediæval alms-dishes, known as "mazer" bowls, made from it, highly polished and generally silver-mounted, are among the prizes of the virtuoso. Allied North-American species yield the beautifully-mottled furniture-woods with which we are all familiar, and which are so commonly imitated by the grainer.

In France the young shoots, being tough and flexible, are employed as whips ; and being exceptionally tolerant of the shears and the bill-hook it recommends itself for hedges and the "topiary" work of geometrical gardening. The leaves and young shoots are also gathered when green and dried for winter provender for cattle ; but though the sap contains a larger proportion of the sugar so characteristic of the genus than does that of the Sycamore, the tree does not bleed freely. Maple sugar is obtained from the two American species, *A. saccharinum*, the Rock or Bird's-eye Maple, and *A. rubrum*, the Scarlet or Curled Maple, the latter only yielding half as much as the former.

Though, in the words of the poet-laureate, our own Maple in autumn will "burn itself away" till all the wood-side glows in the fitful sunshine like dead gold, so

as to commend itself to him who plants for beauty, our native woodland trees can seldom show any autumn colouring that can vie with the surprising blaze of an American forest in the fall, an effect mainly due to the Scarlet Maple, *A. rubrum*. This, together with most of the American and Japanese species, is now commonly cultivated as an ornamental shrub in England; its red flowers in spring being less conspicuous than its autumn coloration. The Sycamore-like *A. rufinerve*, Sieb. and Zucc., from Nippon, with red veins to the leaves, and the many varieties of *A. palmatum*, Thunb., commonly known as *polymorphum*, from the same country, such as the cut-leaved *dissectum* and the copper-tinted *atro-purpureum*, are desirable trees for park and shrubbery; whilst our suburban gardens are now almost overstocked with the variegated *A. negundo*. The bright green of this species, however, with its milky whiteness delicately tinged when young with pink, is well suited to contrast in such situations with the regular and sombre Wellingtonias, with "purple" Beeches, or with masses of green Lilac bushes.

Maples are chiefly propagated by seed, though the varieties must of course be multiplied by layers, cuttings, or grafts. The seeds ripen in October, and when the samaras, or "keys," as they are popularly termed, begin to turn brown, they should be gathered by hand, and the maturity of the seed be tested by opening one or two of the capsules, and observing if the cotyledons are green and succulent. It is advisable to keep the seeds unsown until spring, since moles eat many of those sown in autumn; but those of our common species seldom germinate until the second or third year. They should not be covered with more than half an inch of soil.

Besides being occasionally blotched in autumn by the attacks of the black fungus *Rhytisma acerinum*, so universal on the Sycamore, the leaves of the Maple are also commonly disfigured either by a mildew or by a gall. The Maple blight or mildew (*Uncinula bicornis*) gives the whole plant a hoary appearance, as if sprinkled with powdered chalk, both surfaces of the leaves being alike affected; but this disease must not be confounded with an unhealthy condition formerly attributed to another fungus, and known as *Erineum acerinum*, which in spring produces patches of pinkish or violet hoariness on the under surfaces of the leaves, glistening like hoar-frost. With equal frequency the leaves of the Maple are seen to be thickly studded on their upper surfaces with red conical swellings. These are the results of the punctures of a mite (*Phytoptus myriadeum*), and they are interesting as an example of the general rule that when such irritation occurs, as is also seen in the galls on the Rose and the Violet, if a pigment is produced it is one which the plant is prone to develop normally either in flower or leaf.







*Cédre.*

CEDAR OF LEBANON.

*Ceder.*



## THE CEDAR OF LEBANON.

(*Cedrus libani*.)



SOME trees may be said to have been familiar from their literary associations even before their actual introduction into this country. This is pre-eminently true of such trees of Holy Writ as the Cedar of Lebanon, the Olive, and the Weeping Willow.

The origin of the name Cedar is somewhat doubtful; but it is probably a Semitic word allied to the Arabic "kedre," meaning "power." But, though so frequently mentioned in the Bible, in classical writers, and by early travellers, the tree itself was certainly not brought to England before the latter part of the seventeenth century.

The genus *Cedrus* belongs to that section of the order



*Coniferæ* known as *Abietinæ*. Like most *Abietinæ*, its branches are given off in whorls. It is mainly distinguished from the closely-allied genus *Larix*, the Larches, by its leaves being evergreen, they being, as in that genus, grouped in tufts, or "fascicled." The other leading characteristics of the genus are the erect position of its cones and the deciduous character of their scales.

The Cedars are a very small group, only three species being recognised, and these entirely confined to the Old World; but many other trees with somewhat similar wood are popularly known as Cedars in many quarters of the globe. The three true Cedars—the Deodar (*Cedrus deodara*) of the Himalayas and Hindoo Koosh, the Lebanon Cedar (*C. libani*), with its small-leaved variety in Cyprus, and the Mount Atlas Cedar (*C. atlantica*)—are so closely allied as to be by some regarded as merely geographical races of one species. As all three are now common in cultivation it will readily be noticed that at different ages each kind nearly resembles the others; and when grown from seed the Lebanon Cedar varies considerably, its branches either drooping or rising in a fastigate manner. The main distinctions between the three are, however, that the Deodar has drooping branches and silvery foliage, the Lebanon Cedar has its branches horizontal and its mature foliage of a dark and somewhat blue green, whilst the Mount Atlas Cedar has ascending branches and needles of a more yellow shade of green.

The most striking characters of the Lebanon Cedar are the numerous large and wide-spreading horizontal branches and the broad and flattened summit of the full-grown tree. When young, one or two leading branches rise above the rest; but the mature form is known to



nurserymen as "clump-headed." These points, together with the fact that the Cedar grows best in a deep soil, where its roots have access to water, are most graphically presented to us in the grand passage in the Book of Ezekiel, the most striking of the many Biblical allusions to this tree :—

" Behold the Assyrian was a cedar in Lebanon with fair branches, and with a shadowing shroud, and of a high stature ; and his top was among the thick boughs. The waters made him great, the deep set him up on high, with her rivers running round about his plants, and sent out her little rivers unto all the trees of the field. Therefore his height was exalted above all the trees of the field, and his boughs were multiplied, and his branches became long because of the multitude of waters . . . Thus was he fair in his greatness, in the length of his branches, for his root was by great waters . . . nor any tree in the garden of God was like unto him in his beauty."

The rich brown bark of the gradually tapering stem becomes deeply scored with age, and contrasts well with the level layers of dark foliage. Though the tree seldom exceeds eighty feet in height, its massive branches often spread from thirty to fifty feet on all sides, the lower ones resting upon the ground, though not rooting in it, thus forming a broad-based pyramid densely clothed with leaves. The horizontal lines of its upper boughs give it, in common with the Stone Pine, an architectural character harmonising with the columns and straight copings of classical buildings. This was noticed by Martin, who is fond of introducing the Cedar into his pictures, particularly into those of the terrace-gardens of Babylon and Nineveh.

Its stately outline and somewhat sombre hue equally entitle the Cedar—alone perhaps among our larger trees—to a position on the trim lawn, or near the stone urns

or vases of the balustraded terrace of a red-brick mansion in the style of the last century.

The dwarf shoots that bear the tufted leaves continue to do so each spring for several years with hardly any lengthening, and ultimately terminate either in a pollen-bearing catkin or a cone. The leaves are straight, nearly cylindrical, but tapering towards their points, and about an inch long, and they remain two years on the tree. On falling, they do not decay for several years, so that a layer of leaf-mould has been observed half-an-inch in depth under a plantation fifteen years old, whilst that under the Cedars on Mount Lebanon is a foot thick.

The Cedar in England grows rapidly, making annual rings from an eighth to half an inch across; but its wood is spongy, very apt to shrink and warp, and by no means durable. It is of a reddish colour and less resinous than that of the Larch. In its mountain home, however, the Cedar grows more slowly and forms a better wood, so that there seems no sufficient reason for doubting that the wood used for Solomon's Temple and palace was that of this tree. It is more doubtful, however, whether Virgil and other classical writers are alluding to the wood of what we now call the Cedar when they speak of it as being incorruptible, and therefore used for statues of the gods. The Romans certainly believed in the preservative character of the resin which exudes from wounds in the Cedar, and which they called "*Cedria*." This was used to protect papyri from the attacks of worms, and is stated to have preserved the books of Numa uninjured in his tomb for five centuries after his death.

The tree seldom flowers until it is five-and-twenty or thirty years old; and it is characteristic that both



*Cônes du Cèdre.*

CONES OF THE CEDAR.

Cedar Apfel.





inflorescences turn upwards. The reddish catkins are about two inches long, but the cones, after fertilisation, become four or five inches in length. When young and green these latter have a pinkish or plum-coloured bloom, which however, they soon lose, becoming a rich brown. The scales of the cone are very broad and tough, though thin, and each of them bears two broadly-winged seeds. Resin exudes from the cones, and after some years the scales fall away from the axis. Squirrels are fond of the seeds, but the Cedar is singularly free from the attacks either of insects or of fungal diseases.

The Cedars on Mount Lebanon have been frequently visited by travellers since the middle of the sixteenth century. Lamartine writes of them :—

“ These trees are the most renowned natural monuments in the world : religion, poetry, and history have all equally celebrated them. The Arabs of all sects entertain a traditional veneration for them. They attribute to them not only a vegetative power, which enables them to live eternally, but also an intelligence, which causes them to manifest signs of wisdom and foresight similar to those of instinct and reason in man. They are said to understand the changes of the seasons ; they stir their vast branches as if they were limbs ; they spread out or contract their boughs, inclining them towards heaven or towards earth, according as the snow prepares to fall or to melt.”

This is the tradition to which Southey alludes in “ *Thalaba*,” when he says :

“ Its broad round-spreading branches, when they felt  
The snow, rose upward in a point to heaven,  
And, standing in their strength erect,  
Defied the baffled storm.”

The mountain is covered with snow during a great part of the year ; but on August 5th, the eve of the Feast of the Transfiguration, the Maronites from the surrounding

villages have long been in the habit of visiting the mountain, and there celebrating the "Feast of Cedars" with singing and dancing, mass being celebrated on the following day at one of the stone altars which stand beneath several of the larger trees. Most of the Cedars show signs of having been frequently struck by lightning.

There are naturally many legends connected with so interesting a tree. One of the most remarkable relates that Seth, sent by Adam to Paradise for the oil of mercy, saw, from the gate of the garden which he was not permitted to enter, a leafless Cedar with branches borne high towards heaven, on which was seated a child in glittering raiment. The angel-guardian of the garden gave him three seeds from the tree, which, on his return, he placed in the mouth of his parent, who was then dead. From these seeds there sprang, on the grave of Adam in Hebron, a Cedar, a Pine, and a Cypress, which united into one gigantic tree. After being carefully protected by Abraham, Moses, and David, this tree was felled by Solomon to form a beam in the temple; but his carpenters, finding it impossible to shape it as they wished, laid it aside, and, after forming a bridge over the brook Kedron, and being thrown into the Pool of Bethesda, to which it imparted its healing virtues, it ultimately formed the wood of the Cross.

The actual date of the first introduction of the Cedar into England is uncertain. A most improbable tradition assigns the planting of the celebrated trees at Enfield and Hendon to Queen Elizabeth, but Evelyn in his "*Sylva*" (1664) speaks of the tree as not grown in England, though he had received cones and seeds of it from Lebanon. Probably the oldest existing Cedar in England is that at

Bretby Park, Derbyshire, proved by the gardener's accounts to have been planted in 1676. Its girth is now nearly sixteen feet, and its branches, though many have been lost, still spread about a hundred feet. The Enfield tree was planted by Dr. Uvedale, head master of the Grammar School, apparently between 1665 and 1670, from seed said to have been brought him from Lebanon by a pupil, but possibly given him by Evelyn. William Ashby, a Turkey merchant, is stated to have brought seed from the Levant, between 1680 and 1690, from which sprang the Cedar at Quenby Hall, Leicestershire ; but the trees standing till recently close to the river, in the garden of the Apothecaries' Company at Chelsea, were certainly planted before 1685, under the direction of Sir Hans Sloane.

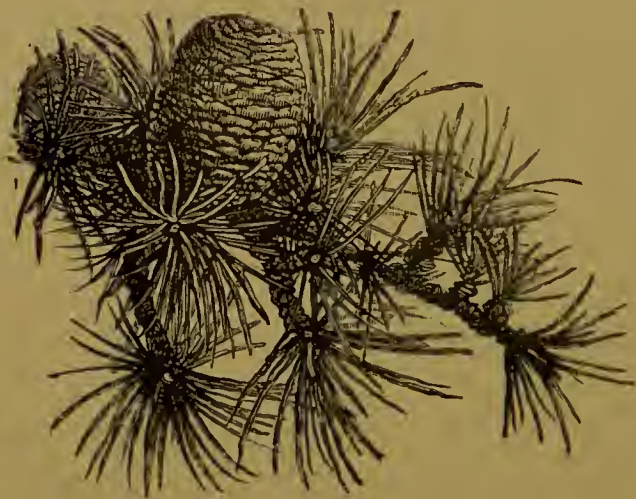
Sir Stephen Fox, the ancestor of Lord Holland, is also stated to have imported the Cedar from the Levant to Farley, near Salisbury, and to Chiswick ; and another of the earliest specimens in the country must have been that planted by Samuel Reynardson at the Cedar House, Hillingdon, Middlesex, cut down in 1789, which was over fifty feet high and spread nearly a hundred feet in 1779. It is also worthy of note that the finest Cedar in Essex, known locally, like so many others, as the oldest in England, is that at Faulkbourne Hall, which from 1677 to 1679 was the residence of John Ray. This tree is eighty feet high, over twenty feet in girth, and a hundred in the spread of its branches.

From the early part of the last century the planting of the Cedar as an ornamental tree has been general. The magnificent grove at Whitton Park, Twickenham, was raised from seed in 1722 by Archibald, Duke of Argyle, who introduced the species into Scotland in 1740. In 1734

Bernard de Jussieu took two plants from England to France, and in 1761 we find the Duke of Richmond buying a thousand plants of the Cedar for Goodwood Park, for seventy-nine pounds, from John Clarke, a butcher at Barnes, who was very successful in raising seed from the great tree at Hendon, which was blown down in 1779.

Of existing specimens, that at Strathfieldsaye, a hundred and eight feet high, is the loftiest; but unquestionably the largest and handsomest is that at Syon House, seventy-two feet high, over twenty-five feet in girth, and sweeping the ground with its branches, which spread nearly a hundred and twenty feet.

The Cedar is not difficult to raise from seed, nor is it at all exacting in the matter of soil; but unfortunately, in spite of Arab tradition, it suffers great damage from the accumulation of snow on the flat fan-like expansions of its evergreen branches.







*Noisetier.*

HAZEL.


Hafel.



## THE HAZEL.

(*Corylus avellana*).



——  
BELONGING to that group of trees characterised by their catkins of simple and inconspicuous flowers, and by their nut-like fruits, more or less enclosed in bracts forming a sheath or “cupule,” often of cup-like shape, the Hazel seldom has the habit or dimensions of a tree. It is generally a shrub, sending up many slender limbs remarkable for their brown bark and their great flexibility. At Eastwell Park, Kent, however, it is a tree thirty feet in height, with a girth of three feet at the ground.

The young twigs are hairy and glandular and of a rusty-brown hue. The flowers appear in January, or exceptionally even as early as October,



but are most frequently not open until March, whilst the leaves do not open until the end of April or beginning of May. The male and female blossoms occur on the same tree, but in distinct clusters or "catkins."

The male catkins are pendulous, first appearing as minute sausage-shaped buds of a dull brownish hue, but lengthening to two inches or more, and becoming, when the anthers are fully matured, of a pale greenish-yellow or primrose colour, which is more decidedly green when the pollen has been shed. Each catkin consists of a number of bract-like scales, each bearing eight anthers on its inner surface, so that a cloud of fine-grained yellow pollen is shaken from them by the March gales, after discharging which they drop off.

The female flowers are grouped in little egg-shaped, bud-like tufts, sessile on the branch, consisting of several overlapping green bracts, each of which bears two flowers on its inner face, the crimson stigmas forming a tassel at the top of the cluster. The flower itself is only a two-chambered ovary, surrounded by a velvety cup-like "bracteole" (which afterwards grows into the large leafy husk or "cupule" of the nut), and is surmounted by a short style and two of the long, crimson, tongue-like stigmas.

Concerning the nut, the Rev. H. N. Ellacombe writes :—

"There is a peculiarity in the growth of the nut that is worth the notice of the botanical student. The male blossoms or catkins (also anciently called agglettes or blowinges') are mostly produced at the ends of the year's shoots, while the pretty little crimson female blossoms are produced close to the branch; they are completely sessile or unstalked. Now, in most fruit trees, when a flower is fertilised the fruit is produced exactly in the same place, with respect to the main tree, that the flower occupied; a peach or apricot, for instance, rests upon the branch which



bore the flower. But in the nut a different arrangement prevails. As soon as the flower is fertilised it starts away from the parent branch ; a fresh branch is produced, bearing leaves and the nut or nuts at the end, so that the nut is produced several inches away from the spot on which the flower originally was. I know of no other tree that produces its fruit in this way, nor do I know what special benefit to the plant arises from this arrangement."

Towards the solution of this problem it may be suggested that as it produces no petals the shrub has energy to form abundant pollen, some of which will certainly be wind-wafted on to the spreading stigmas if there are no leaves in the way. Hence the advantage to wind-fertilised flowers of blossoming before the leaves appear. As the two kinds of flowers in the Hazel often do not come to maturity simultaneously, the advantages of cross-fertilisation are thus secured. Again, *l'union fait la force*, and a cluster or short spike of flowers (each of which is structurally a short branch), surrounded by bracts and sessile on a bough, will stand a better chance of keeping its place, in spite of spring storms, than a single flower. Moreover, the tufted stigmas secure the fertilisation of some of their number. Fertilisation acts as a stimulus. The male catkins have performed their function and have dropped off, so nourishment flows towards the female one. In order, however, that the fruit may not ripen too soon and so fall to the ground and rot before the winter's frosts, it must not develop thus early in spring. The food is, therefore, thus employed in producing a branch below the nascent bunch of nuts.

The leaves of the Hazel are large, heart-shaped and rounded, with toothed edges, a long point, a downy under-surface, and a short stalk. In the bud they are folded into several longitudinal plaits, and when young are bright

and pleasing in hue; but later on they take yellow-brown tints of green and a dull woolliness, that render the tree heavy as a feature in the landscape, except when relieved by the brown stem, the pale green clusters of unripe nuts, or their own autumnal changes into yellow, dull orange, or red.

The Hazel is found in Northern Africa, in Central and Northern Asia, and throughout Europe south of 63° N. latitude, having very much the same range as the Beech. It reaches an altitude of about 3,800 feet in the Alps, and 1,600 feet in the north of Britain.

As the Linden is interesting to us from its association with the name of Linnæus, so the specific name of the Hazel (derived originally from Abella or Avellino, a city in the Neapolitan Campania, where the tree was much cultivated) becomes additionally interesting from its connection with that of our own great tree-lover, John Evelyn. He tells us himself that in some ancient records and deeds in his possession his ancestors' names were generally written, "Avelan, *alias* Evelin." Evelyn's account of the soil suited to Hazels is that they, "above all, affect cold, barren, dry and sandy grounds; mountainous, and even rocky, soils produce them; they prosper where quarries of freestone lie underneath, as at Hazelbury in Wiltshire, Hazelingfield in Cambridgeshire, Hazelmere in Surrey, and other places; but more plentifully if the ground be somewhat moist, dankish and mossy, as in the fresher bottoms and sides of hills, holts, and in hedgerows." In Kent, where the Hazel is abundant both in a wild and in a cultivated state, it thrives best on a light calcareous loam, resting on the ragstone or the chalk; but in Scotland it often grows on a granite subsoil. It seems, in fact, to require at once abundant moisture and good drainage.



*Chatons et fruits  
du Noisetier.*

HAZEL, CATKINS AND  
FRUIT.

Haseln-Kätzchen und  
Blätter.





The name *Corylus* is of doubtful etymology, being variously derived either from the Greek *κόρυς* (*korus*), a cap, from the husk of the nut; or from *καρυον* (*karyon*), a nut. "Hazel" is said to come from the early English "hæs," a behest, connected with the German "heissen," to give orders, the sceptre of authority among the simple chieftains of a more primitive time having been a Hazel-wand.

The wild Hazel has grown abundantly in Britain since pre-historic times, and its nuts appear to have formed part of the food of the Swiss lake-dwellers. Both the Hazel and the Filbert were cultivated by the Romans, who are said to have given Scotland the Latinised name of Caledonia, from Cal-Dun, the Hill of Hazel, whilst the Filbert was called by them *Nux Pontica*, having been brought originally from Pontus. Its modern name is almost certainly a barbarous compound of "feuille," a leaf, and "beard," referring to the long cupule projecting beyond the nut; but in very early times a more poetical origin was found for the name. Phyllis, despairing at the prolonged absence of Demophoon, put an end to her life, but, as Gower tells us in his "Confessio Amantis"—

" Phyllis in the same throwe  
Was shape into a nutte-tree,  
That alle men it might see;  
And after Phyllis, Philliberde  
This tre was cleped in the yerde."

Many of the old vocabularies allude to the same fanciful etymology, and Spenser speaks of "Phillis' philbert."

Virgil states that Hazel-twigs were used to bind the vines; but that, the roots of the nut-tree being considered injurious to the vines from their spreading character, spits

of Hazel were also used in the sacrifice to Bacchus of the goat that browsed on the plants sacred to him. In mediæval times considerable respect seems to have been paid to the Hazel, and many cases have been recorded, both in England and on the Continent, of the occurrence of Hazel-wands in the coffins of ecclesiastics, possibly in commemoration of a pilgrimage performed by the deceased. But its chief importance was for ages derived from its supposed magical powers of divination. The use of the divining-rod would seem, from Hosea iv. 12, to be of extreme antiquity, and the "*virgula Mereurialis*," as it was termed in Roman times, though sometimes, as now, made of willow or other wood, or even of metal, was frequently of Hazel. Its virtue was supposed to depend upon its having two forks, which were so grasped in the fists, with the fingers uppermost, that the free end might turn downward toward the object sought. In other cases the rod was peeled and simply laid on the palm of the hand. In the fifteenth century this art of divination was named rhabdomancy. "It is," says Evelyn, "very wonderful, by whatever occult virtue, the forked stick (so cut, and skilfully held) becomes impregnated with those invisible steams and exhalations, as by its spontaneous bending from a horizontal posture to discover not only mines and subterranean treasure and springs of water, but criminals guilty of murder, &c. . . . Certainly next to a miracle, and requires a strong faith." Even Linnæus confessed himself to be half a convert to this belief, and the practice of "dowsing," as it is there called, is still common in Cornwall and other western counties. According to the local superstition, the rod is guided to the metalliferous lodes by guardian pyxies, the "kobbolds" of

the German miner. It was no doubt this popular term "dowsing" which suggested to Scott the name of Douster-swivel, the charlatan in "The Antiquary," who uses a forked Hazel-rod in his magical performances. The rhabdomist is stated to feel a sudden acceleration or retardation of the pulse, or a sensation of great heat or cold, at the moment of discovery.

It was possibly from this use of Hazel-wands that fortune-telling powers accrued to the fruit of the tree. In many places an ancient custom prevailed, which it was thought unlucky to omit, of going a-nutting on Holy Rood Day, September 14th; whilst the practice of burning nuts on All-Hallows' Eve, October 31st, alluded to by Burns in his "Hallowe'en," and by Gay, was so general that the vigil was called Nutcrack Night. The Vicar of Wakefield and his neighbours, it will be remembered, "religiously cracked nuts on All-Hallows' Eve."

The wood of the Hazel is a whitish red, and close and even in grain, and has been used in turnery, whilst well-veined veneers are obtained from the larger roots. The tree is mainly grown, however, as coppice, its shoots being useful for hampers, for "corf" rods (*i.e.*, for baskets used in Durham coal-pits, known as "corves"), for hoops, wattles, walking-sticks, fishing-rods, whip-handles, &c. Rustic seats and baskets for gardens made of Hazel-rods, varnished with the bark on, are found to be very durable. This coppice also makes good oven-wood, and its charcoal is suited for crayons or for gunpowder.

It is for its fruit, however, that the tree is most valued, for the sake of which it is largely cultivated in "the garden of England" round Maidstone. The rows of heavy, dull-leaved, close-growing shrubs in the Kentish

nut-gardens cannot be considered ornamental—in summer at least. But in the autumn woods, when

“The scrambling shepherd with his hook,  
’Mong Hazel-boughs of rusty brown,  
That overhang some gulping brook,  
Drags the ripened clusters down,”

the Hazel gains the charm of association with the careless joys of our boyhood.

“The scrambling shepherd” will, however, often find, in lieu of the nut he seeks, that chariot of Queen Mab—

“An empty Hazel-nut  
Made by the joiner-squirrel or old grub,  
Time out of mind the fairies’ coach-makers.”

The grub in question, one out of nearly a hundred insects that attack the Hazel, is the Weevil (*Balaninus nucum*), a tawny-brown beetle that may be seen creeping along the boughs or flying round the nut-bushes in the early summer.



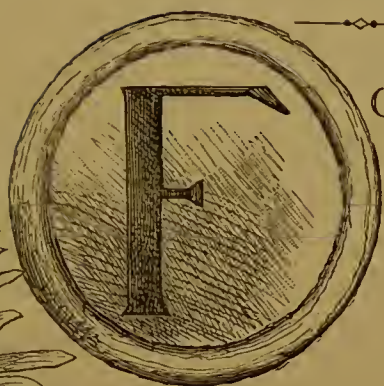






# THE YEW.

(*Taxus baccata.*)



FOR botanist, artist, poet, or moralist, few trees have so unique an interest as the Yew. Wearing the serious aspect of age even in youth, its sombre foliage, massive trunk, and rugged bark form a striking emblem of immortality. Its very name is mysterious in its simple brevity, and has been traced back to the sacred word רתוה, Jehovah, the Immortal. In Latin and in Portuguese, *iva*; in Old German, *iwa*; in Welsh, *yw*; in Anglo-Saxon, *eow*; in Old English, *iw*, *ew*, *ewe*, *eugh*, and *uhe*; in French, *if*; in Swedish, *id*; and in modern Ger-

man, *eibe*, “we find,” says Dr. Prior, “the Yew so inextricably mixed up with the Ivy that, dissimilar as are



the two trees, there can be no doubt that these names are in their origin identical."

In the discussions as to the reasons for its frequent presence in our churchyards several facts are commonly overlooked: first, for example, that the species is an indigenous one, and was formerly undoubtedly far more abundant in Britain and other parts of Europe than at present; secondly, that the trees are often older than the churches, and very probably even than Christianity itself; and thirdly, that in most cases the venerable Yew is on the south or south-west side of the church.

Its hard, durable, reddish wood presents characters that enable us readily to recognise it in the peat-beds of pre-historic times. In the bogs of Ireland, Scotland, and Cumberland, in the Cambridgeshire fens and the submerged "moor-logs" at the mouth of the Thames, it is as perfectly preserved as bog-oak, being of a rich brown tint; and under the microscope this exhibits in the woody fibres, as when alive, a unique combination of "bordered pits" and spiral lines. Whilst, moreover, we may often see trees in situations that suggest their having been planted, no one can have visited the groves of Yew in Cranbourne Chase, on the Hampshire Downs, or the basaltic hill of Arely, in Staffordshire, or have noticed its sporadic occurrence round Coulsdon, in Surrey, or Tunbridge Wells, without being convinced of its truly indigenous character. It is curious to follow with the eye a line of sombre Yews winding along the downs in Surrey or Kent, marking the so-called Pilgrim's Way—a road which leads, not only to many a quaint little sequestered Norman church, with perchance an exceptionally venerable Yew shadow-



ing its silent graves, but also to many a far more ancient earthwork, the fortification of a vanished race of warriors.

The wood of the Yew, which, from being susceptible of a high polish, used to be much valued in cabinet-work, is not, as is often thought, exceptionally slow in forming. The contrary opinion has been formed from a consideration of the slowly-increasing girth of those large trunks of aged Yews which are so disproportionately large, as compared with the extent of bough and leafage, that the formation upon them of the very thinnest growth of wood represents really a very fair total cubic amount.

From the measurement of the layers of annual growth in many Yews, De Candolle concluded that it was within the mark to reckon their increase in diameter at a line a year throughout their life, and it was from such measurements that he concluded that such trees as sometimes occur with a girth of twenty-seven feet, or more, may even have passed the age of two thousand years.

As an evergreen, overshadowing the crops, the Yew would do more harm than larger and perhaps more valuable deciduous trees, and the herdsman must soon have discovered that it was frequently fatal to his cattle, so that it is not to be wondered at that the species should have become less abundant in our hedgerows than it once was. Bearing the staminate and pistillate flowers on different trees, one individual would moreover, if solitary, be unable to reproduce itself by means of seed.

There were, however, many cogent reasons why some specimens of the tree should be preserved. Ages before Christianity had invested the gloomy evergreen of gnarled

red trunk and vastly superhuman longevity with a glamour of superstitious awe and veneration, the fancies of the uneducated had, no doubt, surrounded it with a halo of poetic romance; but we have no positive evidence connecting it with Druidical worship. It is not improbable, however, that its green boughs, "renewing their eternal youth," may have been connected with the Spring festival of Eostre, which the Christian Church was able to sanctify and adopt, as it adopted also the winter use of the Holly, which lent itself yet more readily to Christian symbolism; whilst it was unable to do the same for the Mistletoe, which social progress has gradually stripped of all its impropriety, and of nearly all its significance. As the pagan nations of antiquity in South Europe took the Cypress as a symbol of immortality, so the Yew may well have been adopted in the north; and certain it is that whilst the Holly lingers round ancient British earth-works, and has long effected its entrance into our churches, it does not occur in our churchyards. Even the additional argument that Yew twigs were used to sprinkle the holy water in the "Asperges" before mass will hardly be a sufficient answer to this objection.

The following verses for Candlemas Eve are, however, worth reproduction in this connection:—

"Down with the Rosemary and Bayes;  
Down with the Mistleto;  
Instead of Holly, now upraise  
The greener Box for show.

The Holly hitherto did sway,  
Let Box now domineere  
Until the daneing Easter Day,  
Or Easter's Eve appeare.



*Flours et fruits  
de l'If*

FLOWERS AND FRUIT  
OF THE YEW.

Eibenblüthe und  
=frucht.





Then youthful Box, which now hath grace  
Your houses to renew,  
Grown old, surrender must his place  
Unto the crisped Yew.

When Yew is out, then Birch comes in,  
And many flowers beside ;  
Both of a fresh and fragrant kinne,  
To honour Whitsontide."

It is not only for Easter decorations that Yew-boughs are utilised by the Church ; for, out of the lands of palms and olives, the Catholic Church has to make shift with Willow and Yew on Palm Sunday, so that the latter tree has in many districts acquired the name of "palm," though Willows are more generally so called. That staunch Protestant, William Turner, need not have opened, as he does, the vials of his wrath upon the Popish priests for this custom as a deception, since the prayers in the mass for the day expressly add the words, "and other trees," after mentioning palm and olive. In the Churchwardens' Accounts for Woodbury, Devon, in 1775, it is recorded "That a Yew or Palm tree was planted in the churchyard, ye south side of the church, in the same place where one was blown down by the wind a few days ago, this 25th of November."

The Yew was also used in funerals—a custom alluded to by Shakespeare in "Twelfth Night," in the line—

"My shroud of white, stuck all with Yew ;"

and Sir Thomas Browne suggested that sprigs so used have taken root and grown into our churchyard trees. Again, in some parts of the country corpses were rubbed with an infusion of Yew leaves to preserve them.

Perhaps the best evidence, *faute de mieux*, to connect the Yew with Druidic times is the fact that it is particularly abundant in the churchyards of Wales and the west of England. In the churchyard at Mamhilad there are, for instance, twelve or thirteen trees, one of which has a girth of more than thirty feet.

Some one has said that the religion of one age becomes the superstition or witchcraft of the next; so perhaps the "slips of Yew sliver'd in the moon's eclipse" by the weird sisters in "Macbeth," may point not merely to the well-known poisonous character of the tree, but also to a former reverence for it.

Man is apt in all ages to be utilitarian, and if the shade of the "dismal Yew" had once been a rendezvous for the clan where the Druid, as chief medicine-man, dispensed justice and wisdom, it was, no doubt, soon found desirable that the material for the chief weapons of the day should be enclosed, that it might not be browsed, with results possibly fatal, by the cattle. It is probably to this use of it for making bows that the tree owes its Latin name of *Taxus*. Thus in his earliest botanical work, "Libellus de re herbaria" (1538), William Turner writes: "*Taxus* an uhe tre unde hodie apud nos fiunt arcus;" and the poet Spenser, in 1590, speaks of it as—

"The eugh, obedient to the bender's will."

It was to bows of Yew that we mainly owed the victories of Crécy and Poitiers; Edward IV enacted that every Englishman should have such a bow of his own height; and so peaceable a man as Elizabeth's tutor, Roger Ascham, as we see from his "Toxophilus" (1544), regretted the day when—

“England were but a fling  
But for the eugh and the grey goose wing.”

Its position to the south, or more strictly south-west of the church, must probably be accounted for by some such belief as that referred to by Robert Turner, in his “*Botanologia*” (1664), as follows :

“The Yew is hot and dry, having such attraction that if planted near a place subject to poysonous vapours, its very branches will draw and imbibe them. For this reason it was planted in churchyards, and commonly on the west side, which was at one time considered full of putrefaction and gross oleaginous gasses exhaled from the graves by the setting sun. These gasses, or will-o'-the-wisps, divers have seen, and believed them dead bodies walking abroad. Wheresoever it grows it is both dangerous and deadly to man and beast ; the very lying under its branches has been found hurtful, yet the growing of it in churchyards is useful.”

This belief in the fatal effect of even sleeping under the boughs of the Yew dates from Galen and Dioscorides ; whilst Cæsar records the death of Catibulus, king of the Eburones, from drinking its juice. Gerard, however, in his “*Herball*” (1579), rashly denies all this, saying, “All which I boldly affirm as untrue, because I have eaten my full of the berries, and slept in the branches, not once, but oft, without hurt.”

The facts would seem to be that the seeds themselves are poisonous, but the fleshy pink cup, or “*aril*,” as the botanists term it, of which children are so fond, is harmless. As to the boughs and leaves, it appears that cattle can be gradually accustomed to them when mixed with other food ; but that, either when green, or when cut and half withered, they have been repeatedly fatal to horses, oxen, sheep, and deer. Gilbert White was probably right when he said that it was “either from wantonness when

full, or from hunger when empty," that the Yew is eaten by them with fatal consequences. Though the leaves are believed to act as a vermifuge, they are likely to be equally fatal to children, the poison acting either on the cerebro-spinal nerves or directly on the heart.

The topiarian art in many an old farm-house garden shows the Yew, patient under the shears, tortured into peacocks, pyramids, teapots, and other unnatural shapes. Certainly it is a tree which in its varied surroundings reflects many aspects of our history, religion, and social life.







*Aune.*

ALDER.

Schwarzerle.



## THE ALDER.

(*Alnus glutinosa*.)



THE small order of catkin-bearing trees, the *Betulaceæ*, includes only the two genera *Betula*, the Birches, and *Alnus*, the Alders. These are mainly distinguished by the character that, whilst in the Birch the scales constituting the fruit-bearing catkin are thin, and fall off simultaneously with the fruit itself, in the Alders these scales become thick and woody, and remain on the tree as a minute cone after the fruits have been discharged.

The few species constituting the genus *Alnus* are shrubs or trees, seldom reaching a large size, and range from Japan through Asia, to the north of the Himalayas, throughout Europe, North



Africa, and North America, and along the Andes into Chili ; but our one British representative of the group is confined to the Old World. Its distinctive feature is its leaves, which are roundish, with a wedge-shaped base, a wavy and slightly-toothed margin, and a short stalk, whilst they are hairy and glutinous when young—whence the specific name, *A. glutinosa*—and glossily dark olive green on both surfaces later on.

Though it may grow to a tree of considerable size, even reaching a height of seventy feet, and more than nine feet in girth, it does not usually exceed thirty or forty feet in height, or six feet in circumference, and is so commonly treated as coppice that it is most familiar to us in rounded clumps of a bushy habit, with several stems, none of which exceed half that size. Then it is that what beauty it possesses is revealed, as it grows, either with Willows or isolated, on the banks of streams in our midland or northern counties. Gilpin indeed speaks of it as growing in perfection on the banks of the Mole ; but there are far finer specimens by many more northern streams. “He who would see the Alder in perfection,” he writes, “must follow the banks of the Mole, in Surrey, through the sweet vales of Dorking and Mickleham, into the groves of Esher. The Mole, indeed, is far from being a beautiful river : it is a quiet and sluggish stream ; but what beauty it has it owes greatly to the Alder, which everywhere fringes its meadows, and in many places forms very pleasing scenes, especially in the vale between Box Hill and the high grounds of Norbury Park.” In such situations our attention has often been called to the beauty of its rich masses of foliage as they overhang the golden beds of marsh-marigolds, or, later in the year, the



foamy banks of meadow-sweet and the gorgeous magenta spikes of the loose-strife. Like all water-side plants, it retains its leaves longer than the deciduous trees of dry situations, keeping them sometimes until January; and, as they do not change colour in autumn, its verdure is pleasing, even though the rigidity of its branches detracts from its gracefulness. Sir Thomas Dick Lauder justly supplements Gilpin's remarks with the observation that the Alder is as often associated with the more rugged scenery of the glens and ravines of Scotland, where it grows at an altitude of 1,600 feet, as with that of the tranquil alluvial vales of England. Some of the most striking individual trees, indeed, known to the present writer are some gnarled, crooked, and round-headed standard specimens, of no very exceptional size, in a mountain glen among the ancient Scots firs of the forest of Ballochbuie, near Balmoral.

Though it certainly flourishes best where its main roots are some little height above the water, the Alder is more tolerant of stagnant water around it than any other European tree; and from the dense mass of rootlets which it puts out in such situations, no tree is so well adapted for holding together the banks of rivers.

The bark of the larger stems is nearly black, and is full of clefts, as was noticed by Virgil in the passage which Dryden renders—

“As Alders in the spring the boles extend,  
And heave so fiercely that their bark they rend.”

Nor is there anything noticeable in the appearance of the ascending branches, so that, when leafless, the tree is not attractive. We may console ourselves, however, even

amidst the comparative absence of beauty in the season of bare boughs; for if the grouping of branches is not beautiful in itself it is almost sure to appear so when the tracery of Nature's solid beamwork, and of her delicate lacework of twigs, is crystallised with hoar-frost. When, too, we see how our exotic evergreens suffer from the cold, and how the Yew-trees on the North Downs are bent towards the east by the westerly gales of autumn and winter, we can appreciate the provision of Nature by which the trees of the colder temperate regions are, as a rule, deciduous.

When in autumn the Alder-swamps are strewn with the newly-felled stems it will be seen that the live wood of the tree is white, but that it becomes red, as if with blood, where it is cut, and afterwards fades to a permanent pale pink. It is soft, with short fibres, giving it a homogeneous texture, and of moderate density, and is of exceptional durability if kept either perfectly dry or under water. It was used by the ancients for boats, possibly "dug-out" canoes; and Virgil stating that this tree formed the first material so employed, Professor Martyn suggests that a hollow Alder, falling into the stream on the banks of which it grew, may have given to man the first idea of a boat. Both Pliny and Vitruvius mention its employment for piles, the former also stating that it was used for water-pipes and for protecting river-banks, and the latter that the city of Ravenna was founded upon piles of its wood. According to Evelyn, the celebrated bridge of the Rialto at Venice was similarly founded; and even down to the present day Alder-wood is used for piles in Holland. It loses about a third of its weight and a twelfth of its bulk in drying, but does not warp



*Chalons et feuilles  
de l'Aune.*

ALDER, CATKINS AND  
FOLIAGE.

Schwarzerlen-Kätzchen  
und -Blätter.





subsequently, so that it is suitable for turnery, carving, cabinet-making, clogs, sabots, and wooden platters. It has also been largely used for the staves of herring-barrels, and from its softness, which prevents it from splitting, it is recommended for wheel-barrows and stone-carts. Old trees with wood full of knots, when cut into planks, have all the beauty of the curled maple, with the colour, though not the grain, density, nor lustre of mahogany. The wood is, however, liable to the attacks of the larva of a small beetle, for which reason sabots made of this wood in France are hardened by smoking. It is also recommended to immerse Alder logs for some months in peat, to which lime has been added, and to varnish any furniture made from them. Being rich in tannin, the wood, if left long in peat, becomes as black as ebony, and when newly felled it takes a stain readily, so as sometimes to be used as a substitute for that wood; but it is far too soft to admit of the lustrous polish of so exceptionally dense a timber.

As fuel the Alder is far inferior in heating power to the Beech, but for this reason is useful for purposes where a slow heat is wanted. By far the chief use of the tree at the present day is for gunpowder-charcoal, for which purpose it is grown to a considerable extent, being only inferior to the Alder Buckthorn—the so-called “Dog-wood”—(*Rhamnus Frangula*) and to the White Willow (*Salix alba*). It is treated as coppice, and cut down every five or six years. The branches, which should be about four inches in diameter, are somewhat triangular in section, which gives a characteristic form to their small pith. The charcoal of the Alder is used for powder for heavy ordnance, or for the commoner commercial kinds.

The Alder is one of the woods which has of late been to some extent employed for paper-making. A ton of green wood yields three hundredweight of fibre, which bleaches fairly well, so as to be suitable for paper of various qualities.

From the time of Theophrastus the bark of the young shoots has been used for dyeing and tanning leather. When these shoots are less than a third of an inch in diameter their bark yields no less than sixteen per cent. of tannin. They produce red, brown, or yellow dyes if used alone, and black on the addition of copperas. The natives of Lapland are stated to use the Alder as a dye for their leathern garments, chewing its bark, and then employing their saliva, which becomes red in the process.

As final recommendations of the planting of this somewhat neglected tree in our swampy meadows, it may be mentioned that its boughs, from their durability in water, are especially suitable for filling in drains in wet land, and that it is exceptional in not in any degree injuring the grass that grows beneath it, either by its shade or by its fallen leaves. This last characteristic is alluded to by Browne in "*Britannia's Pastorals*," where he writes—

"The Alder, whose fat shadow nourisheth,  
Each plant set neere to him, long flourisheth."

As in the allied Bireh, the male and female catkins are in the Alder on the same tree. They appear before the leaves, the male ones being visible in autumn and the female ones being often conspicuous among the dark branches in March, whilst the leaves do not appear till the end of April or the first half of May. The male catkins are from two to four inches long, and of a dark red

colour, from the shield-like scales which protect the anthers and their pollen from rain and premature winds ; whilst those bearing the female flowers are seldom an inch in length, and resemble miniature fir-cones of a reddish-brown hue. When the small winged fruits have been ripened and set free, the woody bracts hanging in catkins on the bare boughs still more forcibly suggest this resemblance.

The Alder can be reproduced either by layers, or by large cuttings, or "truncheons," two or three feet long. These it is recommended to leave during a winter and spring with their ends in water before planting. The tree is, however, preferably multiplied by seed. The cones should be gathered in dry weather, when their scales are beginning to open ; and the seeds are best sown in November or December, in soil not exceptionally moist, and kept covered with pine needles, or other light dry litter, until April, when the seedlings will be fairly up. These may be transplanted in the nursery when a year old, and planted out at two years old.

The glossiness of its foliage gives the chief value to the Alder in a landscape. Folded in the bud like a fan, and enclosed by two pale-coloured "stipules," the leaves are at first hairy, as well as glutinous. They can thus shoot off moisture that might induce decay in the buds, or subject them to the action of frost. By retaining their hairiness for some time the young leaves may also derive some advantage from the traces of ammonia in the dew ; but when their cells become choked with the waste products of their digestive processes the now darker leaves become smooth. At all times they somewhat resemble those of the Beech, but are duller and darker in hue. In fact, the dark green of the tree and its compact growth in rounded

masses render it sombre and heavy when the sun is not on it. The cut-leaved variety gains considerably in lightness ; but, though there are many trees more valuable and more beautiful, there is yet an undeniable charm belonging to the glossy clumps of the ordinary form. When we see it overhanging some stream or pool, contrasting with the blue-grey of the iris or the reed-mace, or with the gay flowers of the water-crowfoot or arrowhead, while the dab-chick or the water-vole find a home among its roots, or a temporary shelter beneath its boughs, the Alder forms by no means an unpleasing foil to its gay surroundings.







*Sapin rouge.*

SPRUCE FIR.

Nothtanne.



## THE SPRUCE FIR.

(*Picea excelsa*, LAM.)



SOME groups of plants in their geological antiquity, their structural isolation, and the strongly differing types which they include, seem to stand apart, like the shattered monuments of a vanished race. This is pre-eminently true of the Gymnosperms, those flowering plants without true fruits, bearing their seeds exposed, generally on the inner faces of scales forming a cone. They date back at least to Devonian times, and were the most prominent members of the flora of the whole earth for ages before the appearance of the broad-leaved trees and the gaily-

flowering herbs of the field. All the existing representatives of the group are trees or shrubs; and though, in the

central pith, the annual rings of wood, and the separable bark, their stems resemble those of dicotyledonous trees, in other respects, especially in their floral organs, they approximate rather to the flowerless Cryptogamia. The Cycads of the southern hemisphere are the lingering remnant of what was once one of the best represented types : the Yew and the Maidenhair Tree are almost the sole representatives of another and very distinct group ; whilst the marvellous *Welwitschia* of Angola is even more isolated in structure and without any known ancestry. Far more than ninety per cent. of existing Gymnosperms belong to the order *Araucariaceæ*, in which the stem is much branched, the leaves mostly simple and of relatively small size, with an entire, or unnotched, margin, and the flowers of the two sexes generally on the same tree, the female ones forming the well-known cones of bracts in the axils of which are other seed-bearing scales. This order is divided into four families, the first three of which seem to have culminated in importance during past geological periods. These are the *Cupressineæ*, including the Cypresses, Junipers, and Arbor-vitæ ; the *Taxodiææ*, including the *Sequoia*, or Mammoth Tree and Redwood of California, and the Deciduous Cypress of the Mississippi ; and the *Araucariææ*, including the Puzzle-monkey or Chilian Pine, the Norfolk Island and Moreton Bay Pines, and other mainly southern forms. The fourth family, which seems to be more abundantly represented now than at any past period, is the *Abietineæ*, including Pines, Cedars, Larches, Firs, and Spruces. In all these last-mentioned types the leaves and scales of the cones are arranged in a spiral manner ; the two sexes occur on the same tree ; the bract is only united to the seed-bearing scale by its base, and each of these



scales bears two winged seeds; whilst the pollen-grains also have bladder-like expansions to aid in their dispersal.

There has been considerable confusion as to the names, whether classical, popular, or scientific, of these trees. The word "fir," the torch or fire tree, was originally applied to the Scotch Pine (*Pinus sylvestris*), and *Picea* and *Abies* were used almost indiscriminately by classical writers for the Norway Spruce or for the Silver Fir of Central Europe, whilst modern botanists have been hardly more decided. In his "Names of Herbes" (1548), William Turner says:—

"*Picea* is called in greeke as Theodore Gaza turneth, pitys, and after Ruellius pence and it is called in duch rottē Dan, wherfore it maye be called in englishe a red firre tree."

It is, however, very doubtful whether the Norway Spruce had been then introduced into this country, though it is probably the tree which both Pliny and Turner knew as *Picea*. The Spruces differ from the Pines, Larches, and Cedars in that their leaves are arranged singly in a spiral along elongated shoots, and not tufted or grouped on lateral dwarf shoots. From the former group they are further separated by the absence of any woody thickening at the ends of the scales of their cones; their seeds, too, ripen in a single year. From the Firs proper, of which the Silver Fir (*Abies pectinata*) is the best known, they differ in their leaves being four-angled and prismatic in section, instead of flattened and two-edged, and in their cones hanging downwards after fertilisation, and (after having shed their seeds) dropping off whole, instead of falling to pieces while on the tree.

The Spruce is the loftiest of European trees, reaching a height of 125 to 150 feet, or even, in its native country, as much as 180 feet, with a straight, tapering stem from

two to six feet in diameter, and sweeping branches disposed very regularly round it, giving it, with the long straight leading shoot, a very conical outline. Both this shoot and those terminating the main boughs generally give off a whorl of branches above, and some less well-developed branches, not in a whorl, below; but the secondary branches are produced mainly at the sides of the primary ones, so as to form broad horizontally spreading sprays. In young trees the branches are nearly horizontal; but in older ones—though if crowded many of the lower boughs will die and drop off—if free scope is given for growth a very graceful pendant habit is assumed, branches sweeping down to the ground, and even taking root and again taking a vertical direction, so as to form a grove of young trees round the original stem. Similar anomalies of growth are not uncommonly exhibited by Spruces that have been blown over. Such specimens may be seen among the forests of Norway, and have been described from the Whim, an estate at the foot of the Pentland Hills. They serve to illustrate the fact that the Spruce may be readily reproduced by the system of “layering,” or pegging down considerable branches. The root generally spreads a good deal horizontally, which, together with the preference of this species for soft and somewhat moist soil, renders it more liable to be prostrated by wind than the tap-rooted Pine. The bark of the trunk is rather thin, warty, and of a reddish-brown, becoming scaly as the tree gets older.

The leaves are generally less than an inch long, sharp-pointed, slightly curved, very stiff, and of a dark though clear green; and they are so arranged on the shoot, the upper ones directed forwards along the stem and the lower ones sideways, as to give a somewhat flattened appearance



*Pommes du Sapin rouge.*

SPRUCE FIR-CONES.

Tannenäpfel.





to the individual sprays, though not so regular as those of the Yew.

The pollen-bearing catkins are produced near the apex of the lateral shoots, generally several together, on stalks, which elongate considerably. They are of a yellowish colour, tipped with red, and cylindrical in form, becoming ultimately curved, and as much as an inch in length; but in their earlier stages have been compared to half-ripe strawberries.

The cones are borne mainly at the ends of the upper branches, and in the flower stage stand erect, and vary in colour, according to soil or situation, from green or yellow to pink, dark red, or purple. After fertilisation they become pendant and green, taking the form of a pointed cylinder, from five to seven inches long and from an inch and a half to two inches broad. Their scales are thin, with their edges slightly curved inwards and notched at the top. There are from 160 to 180 of them in each cone; and as each bears two seeds at the base of its inner surface, an ordinary cone may yield from 300 to 350 seeds. In autumn the cones ripen to a rich and glossy brown hue; but it is not generally until the drying wind and warm sun of the following spring that they discharge their seeds.

The Spruce grows almost as rapidly from seed as does the Scotch Pine; for, though for three or four years not exceeding six or eight inches per annum, after reaching a height of three feet the plants will grow from two to three feet a year until they are fifty feet high, so that they may be as much as fifteen feet at ten years old, whilst they may attain in fifty years to a height of a hundred feet. In its native country the tree is not thought to live much beyond a hundred or a hundred and fifty years, and the best Spruce

timber brought into the market is from seventy to ninety years old.

The species is widely distributed both in latitude and longitude—more so, in fact, than many of its allies, being indigenous alike in the Kurile Islands and Siberia as in Norway, and from the Swiss Alps to beyond the Arctic Circle. Though in its extreme northern area it seldom occurs at an altitude of more than 750 feet above sea-level, in the south of Norway it reaches more than 3,000 feet, at the same time descending the shores of some of the fjords down to the water's edge. It is, in fact, the prevalent tree of the basin of the Baltic, and Loudon states that the finest Spruce forests which he had seen were between Memel and Königsberg, growing in peaty soil, resting on sand, and liable to inundation during a great part of every winter. It is, in fact, owing to its requirement, for its successful cultivation as a timber tree, of soil that in England or Scotland can be profitably cultivated for agricultural crops that the Spruce has not been so extensively planted as the Pine and the Larch, which flourish in drier and more barren soils.

The wood of the Spruce is generally white, more elastic, less resinous, and consequently lighter, than that of the Scotch Pine. When grown in the open, where large branches may be broken off, it is apt to be very knotty; but in denser forests, where it is drawn up, it is fine and even in grain. It has been largely imported into England from Norway "in the round," for masts, spars, scaffolding, and ladders. These are, however, the smaller trees, imported with the bark on. The larger trees are sawn up, and are known as White Baltic, Norway, Christiania, or Danzig deal. They are much used in building, both for joists and

for flooring, while of late years immense quantities have been brought over in a manufactured state as door and window frames or cheap furniture. The waste is used in Sweden for matches and for paper-pulp. The wood is durable when kept dry, as when the bark is left on, and its grain adapts it for carving, polishing, or gilding.

The resin, though less abundant than that of the Pines, is of considerable value. It oozes as a fine yellow turpentine, known as "Spruce rosin" or "frankincense," from cracks in the bark or from artificial incisions, for as long as twenty years; but eventually the wood is rendered valueless for timber, and even almost useless for fuel. By melting, boiling with water, and filtration, the medicinal Burgundy pitch is prepared from this resin in the Vosges Mountains, besides small quantities of colophony, lamp-black, and spirits of turpentine.

In Norway the bark is used for tanning, though inferior to that of the Larch, and in times of scarcity the sweetish bast is even ground down with meal as a bread-stuff. The roots also in the same country are split and boiled in a ley of wood ashes and sea-salt, which so loosens the fibres that they can be twisted into cordage, with which thin planks of the wood are tied together into extremely light and portable canoes. The young shoots, too, are used as winter fodder, or are spread, with those of the juniper, as were rushes in the England of the olden time, on the floors of churches and private houses; whilst in all countries where the Spruce grows decoctions of these shoots in fermented liquor are used as a beverage, or as a remedy for scurvy.

As a tree, the chief value of the Spruce is as a nurse, its dense foliage and tapering form serving well for the pro-

tection of young oaks or elms, whilst the thinnings prove fairly remunerative as hop-poles. Its tendency to preserve its lower boughs renders it a valuable cover for game; and, as it bears the shears well it is used on the Continent for hedges in nursery gardens.

Broken down by loads of snow or boisterous wind, the Spruce, as seen in Alpine landscapes, attracted the pencil of Salvator Rosa; but from the point of view of the picturesque, in a young state and in lowland scenery, it suffers in the estimation of most people by the extremely symmetrical regularity of outline that accompanies its somewhat sombre coloration.







*Peuplier Tremble.*

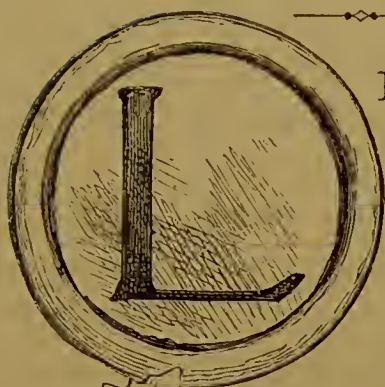
ASPEN POPLAR.

Aspe.



## THE ASPEN.

(*Populus tremula*.)



LIKE the Willows, with which group they constitute the natural order *Salicaceæ*, the Poplars are so variable a series of trees as to present considerable difficulties to the systematic botanist. Their chief distinctive characters have already been pointed out in treating of the Lombardy Poplar ("Familiar Trees," First Series, pp. 59, 60). They are all of them deciduous trees, flourishing in moist but not stagnant soil, especially near running water, though singularly tolerant of the smoke of cities. Their rapid growth often renders them valuable as screens, and their broad and tremulous leaves give

them a cheerfulness which does not belong to the narrow-



leaved Willows. This constant agitation of the foliage by the least breath of wind, owing to the unusual length and flattened form of the leaf-stalk, though common to the whole genus, is most conspicuous in the case of the Aspen (*Populus tremula*, L.). In all Poplars the trees are unisexual; the vinous-red, caterpillar-like catkins of anthers that colour the leafless trees and strew the ground in April being as conspicuous in the case of the male plants as are the thickly-packed woolly seeds in summer in that of the females.

The wood of all the Poplars is soft, light, and white or pale yellow, durable if kept dry, and with that remarkable resilience and freedom from splintering which, occurring as it does likewise in Willows and Alders, would seem to be characteristic of the rapidly-grown timber of water-side trees.

The chief structural characters of the Aspen are that its shoots are downy, and its leaves on very long stalks; those on the suckers heart-shaped, pointed, but not toothed; those on the branches rounded, with incurved teeth; and all of them silky on the under surface when young, though generally becoming smooth later. Its buds are slightly viscid, and the flowers in the female catkins are densely crowded together. The lobed catkin-seales are fringed with hairs; the two stigmas are each divided into two erect segments; and in the male plant each catkin-seale bears generally eight stamens in its axil.

The Aspen is not usually a large tree, though Loudon records a specimen at Castle Howard, in Yorkshire, one hundred and thirty feet high, and three and a half feet in diameter, and various other examples reaching diameters



of four feet, and one at Bothwell Castle, Renfrewshire, one hundred and seventecn feet in the spread of its branches. This latter tree was eighty years old; but the species is not a long-lived one, and, like all Poplars, is very liable to rot from the tearing off of boughs by wind, and to subsequent attacks by various insects. As the tree gets older its horizontal branches become pendulous. The young shoots are generally reddish, with prominent brown hairs—or both these shoots and the root-suckers may be hoary—but they are never cottony as in some other species.

Like all trees having a wide geographical range, the Aspen, though not now much esteemed as timber, has been applied to a variety of uses. In Asia it occurs mainly in the north and in Asia Minor; it is abundant throughout Russia from the White Sea to the Caucasus, and throughout Northern Africa and the South of Europe; and it is indigenous in Ireland and as far north as Sutherland. In America it is represented by the closely allied forms *Populus tremuloides* and *P. grandidentata*. The Athenian Poplar (*Populus græca*, Ait.) is apparently also an American form, deriving its name from Athens in Georgia. The Aspen grows at an altitude of 1,600 feet in Aberdeenshire. Its bark has been employed in tanning, and its wood is used in turnery and cooperage, as well as for many minor purposes such as sabots, clogs, and to a small extent for gunpowder charcoal.

During the last ten years the wood, in common with other species of Poplar, has come into extensive use in the manufacture of paper-pulp, for which purpose wood is rapidly superseding the Alpha or Esparto grass of the western Mediterranean.

Formerly, however, it must have been more valued than it is now, for in the reign of Henry V. an Act of Parliament was passed (4 Hen. V., c. 3), which was not repealed until the reign of James I., to prevent its consumption otherwise than for the making of arrows, with a penalty of a hundred shillings if used for making pattens or clogs. Spenser alludes to it as "the Aspine good for staves."

Where the beaver lingers the bark of the Aspen forms its principal food; and deer, goats, sheep, and cattle are fonder perhaps of green Aspen leaves than they are of those of any other tree.

Its roots, running near the surface, are apt to impoverish the soil, and its leaves, when fallen, kill the grass; though, whilst on the tree, their constant motion so permits the passage of light as to render its shade but very slightly injurious to any plants beneath it. The profusion of suckers springing from its roots, however, make the Aspen an undesirable tree for lawns, meadows, or hedgerows. They yield an abundant supply of faggots, or poles, if the tree be treated as coppice-wood, and cut down either every seven or eight, or every fifteen or twenty years. The rapid growth and usefully-moderated shade of this species adapt it well to act as a "nurse" in moist woodlands for the Oak, or even for the Beech; and it may be propagated either by cuttings, or more readily by seed.

It is, however, chiefly for the grace and beauty of the grey bark of its stem and its rustling leaves that the Aspen is now valued in our marshy woods and by the waterside. This rustling of the leaves, which are scarcely ever still even in the stillest air, is the most striking



*catkins et feuilles du  
Peuplier tremble.*

CATKINS AND LEAVES OF  
THE ASPEN POPLAR.

Aspen=fätzchen und  
=blätter.





feature of the tree, and the point of most allusions to it in literature. Mr. Ruskin, in whose "Modern Painters" the Aspen is treated with such loving detail, when discussing Homer's treatment of landscape, writes as follows on the scene between Ulysses and Nausicaa: "The spot to which she directs him is another ideal piece of landscape, composed of a 'beautiful grove of Aspen Poplars, a fountain, and a meadow,' near the roadside; in fact, as nearly as possible such a scene as meets the eye of the traveller every instant on the much-despised lines of road through lowland France—for instance, on the railway between Arras and Amiens: scenes to my mind quite exquisite in the various grouping and grace of their innumerable Poplar avenues, casting sweet tremulous shadows over their level meadows and labyrinthine streams. We know that the princess means Aspen Poplars, because soon afterwards we find her fifty maid-servants at the palace, all spinning, and in perpetual motion, compared to the 'leaves of the tall Poplar;' and it is with exquisite feeling that it is made afterwards the chief tree in the groves of Proserpine, its light and quivering leafage having exactly the melancholy expression of fragility, faintness, and inconstancy which the ancients attributed to the disembodied spirit. The likeness to the Poplars by the streams of Amiens is more marked still in the Iliad, where the young Simois, struck by Ajax, falls to the earth 'like an Aspen that has grown in an irrigated meadow, smooth-trunked, the soft shoots springing from its top, which some coach-making man has cut down with his keen iron, that he may fit a wheel of it to a fair chariot, and it lies parching by the side of the stream.'"

From Homer to Thomson is indeed a fall ; but there is true observation in the latter's description of

“ A perfect calm ; that not a breath  
Is heard to quiver through the closing woods,  
Or rustling turn the many-twinkling leaves  
Of aspen tall.”

The grace of the whole tree would seem more than once to have suggested the ladies to writers on the Aspen, though their remarks are hardly complimentary. Thus Gerard says of it :—“ In English Aspe and Aspen-tree, and may also be called Tremble, after the French name, considering it is the matter whereof women's tongues were made (as the poets and some others report), which seldom cease wagging.” Among many other allusions to this tree, Scott's address to woman in *Marmion*, as

“ Variable as the shade  
By the light quivering aspen made,”

is one of the best known. Far more strikingly poetical is the old Scottish and English legend on the subject, so beautifully told by Mrs. Hemans :

“ ——— a cause more deep,  
More solemn far, the rustic doth assign  
To the strange restlessness of those wan leaves ;  
The cross, he deems, the blessed cross, whereon  
The meek Redeemer bowed His head to death,  
Was formed of aspen wood, and since that hour  
Through all its race the pale tree hath sent down  
A thrilling consciousness, a secret awe,  
Making them tremulous, when not a breeze  
Disturbs the airy thistle-down, or shakes  
The light lines of the shining gossamer.”

This quivering, to which the tree owes its French

name, is explained scientifically by the length of the slender leaf-stalk and its lateral compression, so that the broad and heavy leaf is suspended on a support which is itself readily acted on by the smallest atmospheric movement. The rustling noise, as of a babbling brook, is produced by the friction of the leaves on one another. The physiological significance of the movement may be to aid in that pumping process by which moisture travels rapidly up from the roots to replace that given off in the transpiration of the leaves. Mr. Herbert Spencer has suggested that movement of branches and leaves in the wind may subserve this purpose in all cases, and it might well be specially advantageous in the case of such a rapidly-growing group of trees as the Poplars.

In March or April the bare grey boughs or brownish shoots are thickly covered with catkins, and the male ones produce a general effect of warm vinous red, until, having fulfilled the object of their existence by discharging their pollen, they fall before the gales of the equinox. When the foliage appears, associations of refreshing coolness and of irresponsible laughing mirth, suggested by the resemblance of the sound made by the leaves to the music of a brook, mingle, as we gaze at their pallid colour, and as the rising wind changes the rippling laugh into a long-drawn sigh, with those of the deepest melancholy; and though, when autumn, "with his gold hand gilding the falling leaf," spreads its badge of splendid decay over each leaf in succession, the tree gains in variety of colour, its rustling gives it then—in that season whose every suggestion is of death—even a more melancholy effect than it had before.

From its more spreading habit of growth the Aspen

has none of the formality in landscape effect of the Lombardy Poplar, and, though useful, along with its congener the Abele (*Populus alba*), in the marshy wood, deserves a place in the foreground of the copse bordering a lake or stream. A row of Aspens in such a situation, relieving the heavy foliage of the lower-growing Alders or Rhododendrons, would prove very effective, reflecting, as it were, in their quivering leaves, the ripple of the water at their feet.







*Frêne.*

ASH.

Esche.



## THE ASH.

(*Fraxinus excelsior*.)



ALLED by Gilpin “the Venus of the woods,” and said by Spenser to be “for nothing ill,” the Ash is certainly one of the more important of our forest trees. It is truly native in Great Britain and throughout the greater part of Europe, whilst in North America it is represented by a closely allied species. Together with the Privets, Olives, Lilacs, and a few other genera, the Ashes form the small order *Oleaceæ*, a group of trees and shrubs with their leaves in opposite pairs, and with the parts of the flower in whorls of four or two, and generally united. The

genus *Fraxinus*, to which the Ash belongs, consists of trees with deciduous foliage, with some at least of their



flowers "imperfect," *i.e.*, wanting either stamens or carpels, and with a winged fruit, or "samara." The etymology of the generic name is very uncertain.

Our common species, *Fraxinus excelsior*, was no doubt so called by Linnæus from its loftiness as compared with other members of the order. Its distinctive characters are the absence of both calyx and corolla, and the "oblong-lanceolate" form and "serrate" margin of the leaflets, of which there are generally from nine to fifteen in each of the compound leaves.

There are frequent allusions to the Ash throughout European literature, since its tough saplings were naturally chosen by both Greeks and Romans for their spears, whilst the agricultural writers of the latter nation recommend its wood for agricultural implements, a use to which it is still largely applied. In Scandinavian mythology the Ash plays a prominent part :

"The primary characteristic of this old Northland mythology," says Carlyle, "I find to be impersonation of the visible workings of Nature. Earnest, simple recognition of the workings of Physieal Nature, as a thing wholly miraeulous, stupendous, and divine. What we now lecture of as Science, they wondered at, and fell down in awe before, as Religion. . . . All Life is figured by them as a tree. Igdrasil, the Ash-tree of existenee, has its roots deep down in the kingdoms of Hela, or Death; its trunk reaches up heaven high, spreads its boughs over the whole universe: it is the Tree of Existenee. At the foot of it, in the Death kingdom, sit three Nornas (Fates)—the Past, Present, Future—watering its roots from the Sacred Well. Its boughs, with their buddings and disleafings—events, things suffered, things done, eatastrophes—stretch through all lands and times. Is not every leaf of it a biography—every fibre there an act or word?"

According to the Edda, an eagle rests on the summit of this mystic tree to observe all that passes in the world, whilst a squirrel constantly ascends and descends to report



those things that the eagle may not have seen. Serpents twine round its trunk, and from its roots flow two limpid streams—that of the knowledge of things past and that of the knowledge of things to come. Man himself was formed from the wood of this sacred tree.

Of traditions and superstitious associations with the Ash there is apparently no end. Evelyn mentions the still lingering practice of passing sickly children through a split made in its stem, as a charm against various disorders; and another practice was to bury a shrew-mouse, which was supposed to bewitch cattle, in a hole in the stem, when a few strokes with a branch would cure the lameness or cramps which the mouse was believed to have caused. Many a rustic, probably, to this day believes that some dire calamity will befall the Crown or country in a year when there are no “locks and keys” on the Ash—a belief which may have only originated in the fact that probably in no year is the tree altogether without fruit, the fruit having for centuries been known in England as “keys” or “locks and keys.” Popular weather-lore has various rhymes as to the probability of a wet or a dry season according as the Ash comes into leaf before or after the Oak; which, however, seem to be diametrically conflicting with one another in different counties.

It is no doubt from the green hoariness of its smooth bark that this beautiful tree derives its popular name in German and English, and few contrasts in tree colouration are more beautiful than its dead-black buds and delicately green young foliage against this ash-grey bark.

The Ash attains a height of from thirty to fifty, or even from seventy to ninety feet, with a girth commonly

of five or six, but in exceptional instances of as much as twenty feet. As the old ballad says :

“The Oak, the Ash, and the Ivy tree—

Oh, they flourished best at hame, in the north countrie.”

Here it is, as in the dales of Yorkshire, that we see it at its best, growing in moist situations in a rich loam. If at all crowded it will form a trunk free from branches to a great height, but when standing alone it throws out large boughs, which divide into numerous branches so as to form a spreading head, whilst in old trees, especially when growing on rocky slopes, the branches acquire a downward sweep. Gilpin, in his “Forest Scenery,” gives a characteristic description of the spray of the Ash :—

“As the boughs of the Ash are less complex than those of the Oak, so is its spray. Instead of the thick intermingled bushiness which the spray of the Oak exhibits, that of the Ash is much more simple, running in a kind of irregular parallels. The main stem holds its course, forming at the same time a beautiful sweep; but the spray does not divide, like that of the Oak, from the extremity of the last year's shoot, but springs from the sides of it. Two shoots spring out opposite each other, and each pair in a contrary direction. Rarely, however, do both the shoots of either side come to maturity: one of them is commonly lost as the tree increases, or, at least, makes no appearance in comparison with the other, which takes the lead. So that, notwithstanding this natural regularity of growth (so injurious to the picturesque beauty of the Spruce Fir and some other trees), the Ash never contracts the least disgusting formality from it. It may even receive great picturesque beauty, for sometimes the whole branch is lost as far as one of the lateral shoots, and this occasions a kind of rectangular junction, which forms a beautiful contrast with the other spray, and displays an elegant mode of hanging to the branches of the tree. This points out another difference between the spray of the Oak and that of the Ash. The spray of the Oak seldom shoots from the under sides of the branches, and it is this chiefly which keeps the branches in a horizontal form. But the spray of the Ash, often breaking out on the under side of the branch, forms very elegant pendent boughs.”

The short, oval, black buds which distinguish our Ash



*Fleurs et fruits du  
Frêne.*

ASH, FLOWERS AND  
SEED VESSELS.

Eschen=blütze und  
=Frucht.





from its American congener, in which they are a greenish white, have attracted the attention of the Laureate, as, in "The Gardener's Daughter," he describes Juliet's hair as

"More black than Ash-buds in the front of March."

He also notes how

"The tender Ash delays  
To clothe herself when all the woods are green."

Often, in fact, this species is not in full leaf until June, though in exceptional seasons, such as 1840 and 1848, leaves may appear in the first week in May. Before the gracefully-cut foliage has, however, begun to burst from the black bud-scales, rich vinous clusters appear in the axils of the branches. These are the panicles of simple flowers, consisting mostly of purple-black anthers, but also bearing simple flask-shaped ovaries, surmounted by a two-forked stigma. The name "Flowering Ash," applied to the manna-yielding species of Southern Europe, is, of course, a misnomer, since our species has true flowers, though they be not the conspicuous objects popularly dignified by that title. *Fraxinus ornus*, the so-called "Flowering Ash," has a corolla of four white petals, differing from those of the allied genera, the Privets and the Lilacs, in being but very slightly united at the base. In this species also there is a small green calyx, but both these "envelopes" of the "essential" organs of the flower are absent in the blossoms of our British tree. In its case the flowers are what is technically known as "polygamous," *i.e.*, some branches of the inflorescence bear stamens only, others only ovaries, and others again bear both. Some Ash trees are, however, exclusively male or exclusively female.

Like most of those trees which, from their flowering before the bursting of their leaf-buds, are termed "precocious," the Ash is probably often cross-fertilised by the wind. Its flowers appear in April and May. It is in June and July, however, that "the Venus of the woods" appears draped in her full beauty of gracefulness. Then the pinnate leaves, each consisting of from four to seven pairs of gracefully-tapered leaflets, arranged at some little distance apart along the mid-rib and at the end of a short leaf-stalk, give a light feathery grace to the whole tree. It may be merely rounded in outline or drawn up to some height, and the green of the foliage is somewhat dull and monotonous when viewed closely; but it is the transparency of the tree, and the play of light through its entire leafage, that give its chief charm to the Ash. Much of this airy lightness is lost in the weeping variety, as the foliage then hangs downwards like the dank green locks of some river naiad; but, like all pendulous trees, the form looks well by the water.

The leaves, with their lance-shaped outlines and toothed margins, are no less remarkable for their early fall in autumn than for their late arrival in spring. They often turn of a clear lemon-yellow before they fall, but as each leaf does so separately the tree is not among our more prominent autumn beauties.

The long and narrow strap-shaped fruits or "keys" hang in dense drooping clusters, which from a glossy sap-green become gradually streaked with a blackish hue, which then colours them entirely until they follow the falling leaves. Evelyn tells us that they were formerly picked when green and pickled with salt and vinegar "as a delicate salading." Their form no doubt assists in the dispersal of

the seed away from the parent shade when the wind detaches it from the bare boughs, and it may also aid in burying it beneath the ground, as it certainly facilitates the introduction of Ash seeds into crevices in rocks, in ruined walls, or in clefts of other trees.

Few trees do more harm to vegetation beneath their shade than does the Ash, from its dense mass of roots sent out horizontally but a little beneath the surface. It is, therefore, most obnoxious to the farmer in the hedgerows of his arable land. It does not, however, absolutely kill grass growing beneath it, so might often be well planted as an ornamental tree on the lawn.

Of individual trees, undoubtedly the most remarkable is that at Woburn Abbey, 90 feet high, with a stem 28 feet high, more than 23 feet round at its base and 15 feet at 3 feet from the ground, with branches spreading 113 feet, and containing timber estimated at 872 cubic feet.

The wood of the Ash is a greyish-white throughout, the sap-wood being used along with the more central portions, an advantage peculiar to but few species. It is more flexible than that of any other European tree, and its value is increased by rapid growth. Few trees become useful so soon, it being fit for walking-sticks at four years' growth, for spade-handles at nine, and when three inches in diameter as valuable as the timber of the largest tree. In the Potteries it is largely used for crate-making, and in Kent for hop-poles. Both the spokes and the felloes of wheels are made from it, and from its flexibility it is in fact "the husbandman's tree" for every kind of agricultural implement. The tree lives to an age of several centuries, but can be most profitably felled at from eighty

to a hundred years old. For smaller wood it is, of course, largely treated as coppice. The roots and knotty parts of the stem are valued by cabinet-makers, and were, according to Evelyn, known as "green ebony."

The timber, when beginning to decay, becomes stained of a blackish hue at the heart, and the young shoots, like those of the holly, are very liable to the malformation known as "fasciation"—"the wreathed fascia" of the older writers—in which several branches grow together in a flattened and often spirally twisted form.

Few trees are less particular as to soil than the Ash; but perhaps the sugar which in warmer latitudes exudes as "manna" from allied species produces in the North that greater luxuriance of growth which gives us the tree in its highest beauty.







*Noyer.*

WALNUT.

Walnuß.



## THE WALNUT.

(*Juglans regia*, L.)



T the first glance we seem in the name Walnut to have an etymological solecism. Whilst, however, the Wall-flower is a flower that grows commonly on walls, the Walnut (a name practically identical with that borne by the tree in Germany) is the Welsh, foreign, or Italian nut, the Italians being to the Germans of the Continent the foreign neighbours that the Britons of Wales were to our English ancestors.

The Walnut was so valued by the Romans, both as yielding a furniture wood and as a fruit-bearing tree, that they probably introduced it both into Germany and

into Britain; but it is not a native of Italy. Its original

home seems to have been the north of Persia, and its Greek names, "Persicon" and "Basilicon," indicate this origin and the esteem in which it was held. From the latter name is derived its specific name of "regia" or royal. According to Pliny, the tree was also called "Caryon" (the origin of the name *Carya*, the Hickory), from the drowsy feeling in the head produced by the smell of its leaves; but possibly this name may be due, as Cowley suggests, to the resemblance of the kernel to the form of the brain.

The Walnut is said to have been one of the antidotes employed by Mithridates King of Pontus; and the bitter principle so abundant in the plant—especially in the leaves, the unripe husk or "pericarp" of the fruit, and the brown skin or "testa" of the seed—has rendered it universally popular as a vermifuge. Similarly, a decoction of the leaves was used by anglers to water the ground, so as to make worms come to the surface.

Introduced into Italy apparently by Vitellius, it was named *Juglans*, "Jove's acorn," and was looked upon as sacred to Diana, whose festivals were held beneath its shade. This seems to have been the origin of the custom of scattering walnuts at weddings.

The Walnut belongs to the small order of trees and shrubs known as *Juglandææ*, comprising only five genera and about thirty species, which are mostly natives of North America. The order is characterised by its aromatic leaves, which are exstipulate, alternate, and pinnately compound; by having staminate and pistillate flowers in separate catkins on the same tree; by an ovary formed from two or four carpels, but one-chambered, surmounted by the perianth, and containing a single erect and unbent ovule,



and by the fleshy fruit, containing a hard "nut" or "endocarp," and a seed with oily cotyledons.

The Walnut is one of the largest trees in the order, growing rapidly so as to reach a height of twenty feet in ten years, when it begins to bear fruit; and ultimately not infrequently attaining a height of between sixty and seventy feet, with a trunk five feet or more in diameter, and large limbs spreading thirty or forty feet from the stem. When young it is liable in our climate to injury by spring frosts; but it increases in productiveness up to a great age, one at Melbury Park, Dorsetshire, being stated to be two hundred years old. It is not particular as to soil, so long as it has good drainage, sending down strong tap-roots even into clefts of rock, and so securing an exceptionally firm hold of the soil. Evelyn considered, however, that the Walnut did best upon the chalk, where, as at Carshalton, Leatherhead, and Marden Park in Surrey, there were, in his time, "considerable plantations of this tree," which, with most of those in other parts of the kingdom, were converted into gun-stocks during the war with Napoleon.

This manufacture is still one of the main uses of the wood of this and of allied species, it being found lighter in proportion to its strength and elasticity than any other timber; but it is also used for pianofortes, furniture, and turnery generally. In young trees the wood is white and liable to be worm-eaten; but as the tree becomes older it is compact, brown, and beautifully veined, though still easy to work. Though now largely replaced for such purposes by mahogany and other foreign woods, Walnut is undoubtedly the most beautiful furniture-wood of Europe. For density and beauty of marking that obtained from trees grown on poor soil is the best; but the most beautiful

veinings are in the roots, which can, however, seldom be procured of a size large enough for any but small articles.

Burrs or excrescences are common on the stems of the Walnut in Italy and in the Caucasus, frequently measuring two or three feet across and twelve or fifteen inches thick, and weighing five or six hundredweight. These are often so prettily mottled as to sell for as much as fifty or sixty pounds a ton, for veneering. The Italian wood is considered the best, that of *Juglans nigra*, the Black American Walnut, being inferior both to it and to that from the Black Sea.

The bark is thick and deeply furrowed on the trunk, but smooth and grey on the younger branches. As the Walnut generally forms its young shoots in April and May, and does not, like the oak, remain in an actively vegetative condition all through the summer, until surprised perchance by early autumn frosts, its symmetry of outline is seldom damaged by wind or cold.

The tree generally comes into leaf and flower in April; but there are both early and late varieties in cultivation. Of these, the former is known as "Noyer de Mars," "Noyer Mésange," or "Noyer à époque tendre," in the south of France, having so thin a shell to the seed that it is commonly pierced by tom-tits (*Gallieé, mésange*), the kernels being eaten whilst the husk is left on the tree. The late variety is known as "Noyer de Mai," "Noyer tardif," or "Noyer de la Saint-Jean," and Loudon mentions a specimen at Chiswick which, in 1835, did not burst a single bud before July 1st. It was no doubt to this variety that the so-called miraculous Walnut-tree of Glastonbury belonged. It grew in the Abbey yard, on the north side of St. Joseph's chapel, and is stated to have never budded



*Feuilles et fruits  
du Noyer.*

WALNUT, FOLIAGE  
AND FRUIT.

Wallnuß=blätter  
und =frucht.





until the feast of St. Barnabas, June 11th, but to have always burst into leaf on that day. This variety, however, ripens its fruit almost as early as the other kinds.

The leaves consist of from five to nine leaflets, that is, of two, three, or four pairs and one terminal one; the whole often exceeding a foot in length. The apical leaflets are generally the larger, and they have all an oval outline with a somewhat produced point, and a very slightly notched or serrate margin. There is also what is termed a Fern-leaved Walnut, in which the leaflets are deeply divided. The leaves are perfectly smooth, though not possessing the lustrous gloss of those of the Spanish Chestnut. They are of a peculiar shade of green with a good deal of yellow in it, which makes a pleasingly cheerful contrast with the foliage of most other trees. In hot weather, or when bruised, they give out a powerful aromatic smell which is said to produce drowsiness or even nausea. Like the roots, the young bark, and the unripe husk of the fruit, the leaves contain astringent matter producing a dark brown dye, which does not require mordants. This dye—which is used by gipsies to stain the skin, and by cabinet-makers to make lighter woods resemble walnut—can be removed from the fingers, when unintentionally applied, by means of salt.

The pendulous male, or staminate, catkins are produced singly from the apex of leafless shoots of the previous year, this being one of the main points of distinction between the genus *Juglans* and the Hickories (*Carya*), in which three catkins are produced from a shoot, formed during the same year, that also bears female flowers and leaves. The cylindrical catkin of the Walnut, which is about three

inches long and three-quarters of an inch in diameter, bears a great number of closely-packed and minute flowers of a simple structure. They each have a short stalk, an adherent bract, two lateral bracteoles, and a perianth of six leaves, enclosing an indefinite number of nearly sessile stamens.

The female flowers are borne in a cluster of four to eight at the apex of the leafy shoots of the same year. They each have an adherent perianth of four leaves in two pairs, besides their bracteoles, and the two-fold nature of the fruit is indicated by the relatively large, fleshy stigmas.

The fruit of the Walnuts and Hickories is unlike that of any other group. It has a fleshy green outer husk or "epicarp," which in the former bursts, when ripe, irregularly, and within this is a woody, two-valved stone or "endocarp," which is produced internally into a membranous partition, deeply dividing and crumpling the fleshy cotyledons of the kernel or seed. This seed is enveloped in a bitter brown testa, and a more delicate cream-coloured inner coat, and its primary root and shoot can be detected near its centre. The variety known in Warwickshire as the "Bannut" and in France as "Noix de Jauge" has a fruit nearly double the size of that of the wild tree, being sometimes as large as a goose's egg; but the kernel shrinks in drying.

Walnuts have long been preserved, either whole, when unripe, or the kernels only, as sweetmeats; but with us the young fruits are more used as a pickle, whilst the ripe nuts, which are not indigestible so long as they will peel, are largely eaten as an autumn and winter dessert fruit. In the south of Europe the oil is largely expressed from the kernels and used by artists for mixing with delicate colours,

for lamps, as a substitute for olive oil, and apparently as a hair-wash, whilst the residual oil-cake is a valuable food for sheep, pigs, or poultry. A bushel of walnuts will yield fifteen pounds of kernels, and these give up half their weight as oil.

To collect the fruit, the ends of the branches are commonly thrashed with long poles. This breaks off many of their points, and so causes the production of new spurs, which will probably bear female, *i.e.*, fruit-bearing, flowers. This thrashing, the improving effect of which is also applied in the proverb to wives and dogs, is therefore also practised in the case of barren trees to make them bear.

As grass and other plants will not grow well under Walnut-trees, they are commonly banished to hedgerows, road-sides, and odd corners; and though, as the tree does not possess any very distinctive beauties, it has not received much notice from the poets, this fact, with its other wrongs and many virtues, is fully recorded by Cowley in the following verses:—

“The Walnut then approached, more large and tall  
Her fruit which we a nut, the gods an aeorn eall :  
Jove’s aeorn, which does no small praise eonfess,  
T’ve ealled it man’s ambrosia had been less ;  
Nor can this head-like nut, shaped like the brain  
Within, be said that form by ehancee to gain,  
Or Caryon ealled by learned Greeks in vain ;  
For membranes soft as silk her kernel bind,  
Whereof the inmost is of tenderest kind,  
Like those which on the brain of man we find.  
All which are in a seam-joined shell enelosed,  
Which of this brain the skull may be supposed.  
This very skull enveloped is again  
In a green eoat, her perieranium.  
Lastly, that no objection may remain  
To thwart her near alliance with the brain,

She nourishes the hair, remembering how  
Herself deform'd without her leaves does show ;  
On barren scalps she makes fresh honours grow.  
Her timber is for various uses good ;  
The carver she supplies with useful wood,  
She makes the painter's fading colours last,  
A table she affords us, and repast ;  
E'en while we feast, her oil our lamp supplies ;  
The rankest poison by her virtues dies,  
The mad dog's foam, and taint of raging skies.  
The Pontie king, who lived where poisons grew,  
Skilful in antidotes, her virtue knew.  
Yet envious fates, that still with merit strive,  
And man, ungrateful, from the orchard drive  
This sovereign plant ; excluded from the field,  
Unless some useless nook a station yield,  
Defenceless in the common road she stands,  
Exposed to restless war of vulgar hands ;  
By neighbouring clowns and passing rabble torn,  
Batter'd with stones by boys, and left forlorn."







*Fusain.*

SPINDLE-TREE.

Spindelbaum.

genus *Euonymus*, which with thirty-nine other small genera constitutes the order *Celastrineæ*. This order of woody plants with simple leaves and small flowers, the sepals and petals of which are four or five in number and are arranged in an "imbricate" manner, is further characterised by having a fleshy and often coloured outgrowth from the coat of the seed, known as an "aril." The affinities of the order seem to be most close to that of the Vines and Virginian Creepers (*Ampelideæ*) on the one hand, and to that of the Maples, Syeamores, Horse-chestnuts, and Soap-berries (*Sapindaceæ*) on the other.

The genus *Euonymus* derives its flattering name, which dates from the time of Theophrastus, and signifies "well-named," from its bad rather than its good qualities. As the Irish peasant to-day euphemistically speaks of the fairies as "the good people" because he is afraid of them, so the ancient Greeks called their avenging deities, or Furies, the Eumenides, or "kind folk," and their mother Euonyme, "her whose name is good." From the fetid smell emitted by the whole plant when bruised, and from their poisonous though lovely fruits, the Spindle-trees have apparently been given the name of this once dreaded being. Their chief distinctive structural characters are their leaves in opposite pairs and evergreen, or nearly so, though their stipules fall off early; the relatively large fleshy disk within the calyx upon which petals, stamens, and ovary are alike inserted; and the angular or winged capsule, which, though dehiscant, is somewhat fleshy in texture.

Our one British species (*E. europæus*) is also a native of Western Siberia, North Africa, and the whole of Europe

from Sweden and Scotland to the Caucasus. Its popular names in English, French, and German, "Spindle-tree," "Fusain" and "Spindelbaum," all alike refer to the use of its wood for spindles, which still prevails where hand-spinning survives as an industry. The old English names "Prick-wood" or "Prick-timber," which latter is used by Gerard, and the French "Bois-à-lardoire," allude to its employment for skewers or larding-pins, formerly called "pricks," whilst another French name, "Bonnet de Prêtre," alludes to the resemblance of its four-plaited capsule to a priest's biretta. A good deal of confusion seems to have arisen in popular parlance between this species and the Cornel (*Cornus sanguinea*), both trees being of about the same size, having opposite leaves, hard, tough wood furnishing good charcoal and easily bored longitudinally, and acridly astringent properties in the leaves and bark. Both trees are consequently known as Prick-wood, as Gatteridge, Gaten, or Gaitre-tree, and as Dogwood. The word "gatr," our modern "gaiter," means apparently a cover, and has been supposed to refer to the capsule hanging when burst like a cover over the seed. In this case the name must belong to *Euonymus*, and has only been extended to *Cornus* by mistake. It may, however, signify a pipe, and allude to the use of shoots of either tree, three or four feet long, as stems for earthenware pipes, for which purpose they are readily bored and are employed both in Russia and Germany. The name Dogwood is derived from the use of the leaves either dried and powdered, or in a decoction, in the treatment of mange or to expel vermin. Turner, in his "Names of Herbes" (1548), speaking mainly of the two species of *Cornus*, *C. mas* and *C. sanguinea*, known as "male" and "female," because the former does not fruit



for some years, also alludes apparently to the Spindle-tree as “an other tree” in the following passage:—

“Cornus is called in groke crania, in duch thierlinbaume, in frëch Cormier or cormer, the male of thys kynde have I sene often in Germany, but never yet in Englande. It may be called in englishe longe chery tree. The female is plētuous in Englande & the buchers make prickes of it, some cal it Gadrise or dog tree, howe be it there is an other tree that they cal dogrise also.”

Though formerly attaining its largest dimensions, as already stated, in Forfarshire, where the large trees were in considerable demand for turnery and cooperage, the Spindle-tree is, on the whole, of but rare occurrence in Scotland, and local in Ireland. In England, however, its smooth bright green shoots and leaves in summer, and its rose-red capsules in autumn, are not uncommon objects in hedgerows or copses. The whole plant is remarkable for its smoothness, for even when the young green wood becomes grey from the development of cork beneath the epidermis, the bark retains an even surface. A point of some physiological interest occurs in connection with this formation of cork. A few woody plants, such as Mistletoe and the Pennsylvanian Maple (*Acer pennsylvanicum*), never form any cork at all, but retain their epidermis and their green colour. Others, such as the Willows and the *Pomaceæ* (*i.e.*, Apples, Pears, &c.), form cork from the epidermis itself, and, like most trees, do so towards the end of the first summer in the life of the shoot. The majority of trees form their cork a little below the epidermis, so as to bury the green layers of the bark beneath its opaque tissue, whilst both epidermis and cork are subsequently split into longitudinal cracks, which may widen into the deep furrows so familiar in the bark on the trunks of Oaks, Elms, or





*Fleurs et baies du  
Fusain.*

SPINDLE-TREE FLOWERS  
AND BERRIES.

Spindelbaum=blüthe  
und =beeren.



Poplars. Anyone cutting a switch of Hazel, Holly, Privet, or, in fact, almost any wood, may notice the bright green layer beneath the dull-coloured external cork. In some few plants, such as the *Clematis*, the Vine, and the Honey-suckle, cork originates yet deeper, viz., in the "bast," of inner layer of the bark, which, as a consequence, comes away in long strips; but in *Euonymus*, whilst it arises, as in the majority of trees, just below the epidermis, its formation takes place not on yearling shoots, but on those several years old, and until it is formed the branch remains green externally.

In April the four-sided shoots put forth their pairs of delicately glossy, egg-shaped leaves, of a rather deep shade of green, each leaf being shortly stalked, two or three inches long, with a finely toothed margin and a tapering point; and among these, about a month later, appear the sparse clusters of inconspicuous blossoms. These are not individually half an inch across, and are of a pale green colour; but they are noticeable from the regularly "tetramorous," or fourfold, arrangement of their parts—four sepals, their margins overlapping, or "imbricate," four petals alternating with them, each of an oblong-acute outline, four stamens, and an ovary made up of four carpels.

It is not, however, till the year begins to wane that the Spindle-tree displays its real charm. The leaves often turn crimson in autumn; but the fleshy, four-lobed fruit is the most distinctive beauty of the tree. Of a rosy red, or more rarely a creamy white, it resembles a cross of coral or ivory, and on bursting discloses one of the most beautiful or most daring of Nature's colour contrasts. This is produced by the "aril," or fleshy covering to each of

the seeds, which, alike in the red fruited and the white varieties, is of a brilliant deep orange. This outgrowth from the "testa" or integument of the seed resembles in structure, colour, and function the more partial and divided covering to the seed of the Nutmeg, which is known as mace; but in the case of the Spindle-tree the development of this outgrowth after the fertilisation of the seed begins, not at the structural base of the seed, its "funicle" or stalk, but at the other end, at the "micropyle," or orifice at which the pollen-tube enters and the primary root leaves the seed; and therefore it is known technically as an "arillode," whilst the mace is an "arillus." The function of either structure is apparently to render the seeds more attractive to birds, and thus to ensure their dissemination. Sir Joseph Hooker alludes to this in the case of the Nutmegs and pigeons of the Molucca islands. Much interest attaches to the obscure question as to the identity or similarity of the æsthetic perceptions, taste, colour, smell, or hearing, in the lower animals, such as the insects that seek honey in the flowers of our gardens or the birds that eat the gaily-coloured fruits of our orchards, with those of man. In this case, however, undoubtedly, as in the parallel instance of the pale blue blossoms of Love-in-a-mist (*Nigella sativa*) amid its vivid green foliage, the deft brush of the Master-Artist has secured by a bold contrast an effect most pleasing to the human eye.

A variety with broader and more glossy leaves and larger fruit, sometimes ranked as a distinct species under the name of *E. latifolius*, is well worthy of cultivation, not only in shrubberies, where it may be well associated with the white-fruited kind for autumn effects, but also as a standard on lawns; but unquestionably the most generally known



species at the present day is the evergreen Japanese Spindle-tree (*E. japonicus*), introduced in 1804, which, with its more decidedly egg-shaped leaves with scalloped margins, luxuriates in the sea-breezes of our southern watering-places; and, with foliage often ornamentally variegated with white or yellow, sustains but little damage even in severe winters, and, though it does not flower or fruit in this country, ably withstands the fatal smoke of London.

The wood of the Spindle-tree seems to have been employed for knitting-needles and spindles by the ancients; and in England was once used for musical instruments. In Scotland, before the large trees of Forfarshire were used up, their wood, with that of the Alpine Laburnum (*Cytisus alpinus*), was used for the staves, alternately white or yellowish and dark brown or black, in the little pails or noggins known as "bickers" or "luggies," used for porridge or as drinking-vessels. Now, however, holly-wood is generally substituted for that of the Spindle-tree. Butchers' skewers have long ceased to be made of this wood, or indeed of any particular species, deal and other woods by no means free from the tendency to splinter being commonly employed; but owing to its toughness, which permits of its being pared down to the fineness of a needle, it is still somewhat in request among watchmakers for pegs used in their work.

Its charcoal is used for the finer kinds of gunpowder, and in France, where this and many other small woods are put to a great variety of uses unknown in this country, it is esteemed for artists' crayons.

In spite of its comparative rarity, it is singular that the beautifully modelled and coloured fruits of this tree should not have attracted more attention from our poets; but

showing brightly, as they do, late into the year, they have suggested to the Laureate the serene wisdom and experience of age. In a short poem called "A Dedication," Lord Tennyson expressly refers to the fruit of the Spindle-tree in the following lines :—

"take this, and pray that he  
Who wrote it, honouring your sweet faith in him,  
May trust himself; and, spite of praise and scorn,  
As one who feels the immeasurable world,  
Attain the wise indifference of the wise;  
And after Autumn past—if left to pass  
His Autumn into seeming-leafless days—  
Draw toward the long frost and longest night,  
Wearing his wisdom lightly, like the fruit  
Which in our winter woodland looks a flower."





*Pin Pignon.*

STONE PINE.

*Genießbare Fichte.*





## THE STONE PINE.

(*Pinus Pineæ*.)

---



F late years no class of trees has been so popular with the generality of those who plant for ornament as the *Coniferae*. They are so separated in their structure from other plants as to form a Class rather than an Order, and embrace, when the name is used in its more comprehensive sense, as is now usual, several very distinct types. In past ages in the history of the globe they formed a more predominant feature in the vegetation of all latitudes than at present; and it is probable that if our knowledge of these fossil forms were more complete there would be found to have been even greater variety among them than among those

that remain to us, showing them to bridge over the gap between such flowerless plants as the club-mosses, and the ordinary fruit-bearing, or angiospermous, flowering plants, more completely than we can at present demonstrate.

The stems of most Conifers branch freely in apparent whorls, having a "racemose" arrangement—so that, especially when the trees are young, they have one main "leader" or primary shoot, which elongates rapidly, and gives the whole tree the outline of an attenuated cone. At a certain age, however, the tree ceases to increase in height; and the last-formed branches lengthening, whilst the lower ones frequently decay, give it a spreading, flat-topped, or parasol-like outline. This is seen to a limited extent in the Yew, the Cedar of Lebanon, and the *Sequoia*; and in the Scots Fir (*Pinus sylvestris*) at an advanced age; but is especially characteristic of the Stone Pine of Southern Europe (*P. Pinea*).

The leaves in Conifers are generally of that dark shade of green which characterises evergreens. They are variously arranged, and narrow or even needle-shaped in form; but it is a distinctive peculiarity of the genus *Pinus* to bear two different kinds of leaves—small membranous scales, and prismatic green needles grouped in twos, threes, or fives on dwarf branches in the axils of these scales.

All Conifers have their stamens and ovules in distinct inflorescences, and in the *Taxaceæ* these are on separate trees ("dioecious"); but most *Araucariaceæ* and all *Abietinæ* are "monœcious." Whilst there is seldom a typical cone among the *Taxaceæ*, or among the *Cupressinæ*, in which the scales are arranged in alternating

whorls, the mathematically exact spirals of the cones of the *Abietinæ* are very characteristic.

Copious showers of pollen are produced from minute staminal scales, many of which are arranged in a flower—that is to say, along an axis which bears no other leaves. In the *Abietinæ* each of these scales bears two pollen-sacs; and in *Pinus* a number of the staminate flowers are collected into a catkin, the apex of which terminates in a cluster of ordinary leaves. Each grain of pollen is furnished with two air-pouches that facilitate its transport by the wind; for, unlike our more showy flowering plants, the Conifers do not rely upon insect agency for the conveyance of the pollen-grains from flower to flower.

As is usually the case in such wind-fertilised flowers, the amount of pollen produced is out of all proportion to the number of ovules. Of these there are in the sub-tribe *Pineæ* but two at the base of each scale of the female cone; but as there may be 150 of these scales, this gives a large number of seeds, many of which, however, prove infertile. The genera that constitute this sub-tribe differ in leaf-characters, and especially in their cones; those of the Spruces (*Picea*) falling off entire; those of the true or Silver Firs (*Abies*) coming to pieces, so that the scales separate from the axis; and those of the Pines (*Pinus*) having the tips thickened into a woody, rhomboidal mass, known as the “apophysis” or “tessella.”

The roots of the *Abietinæ* do not as a rule extend to any great depth; but in the Cluster Pine (*Pinus Pinaster*) and the Stone Pine the tap-root is exceptionally long. It is not, however, long enough in the latter to prevent the occasionally unequal growth of the head giving the



tree a slight cant out of the perpendicular, and sometimes a bend near the base of the stem, produced in its effort to regain the vertical.

The fact that none of the *Abietinæ* throw up suckers from the roots, or shoot again when cut down, gave rise to the Latin proverbial expression, “*Pini in morem extirpare*” (“to destroy like a pine”), for total destruction, and explains a story told by Herodotus. Miltiades, King of the Dolonei, having been taken prisoner by the people of Lampsacus, Cræsus King of Lydia threatened the captors that unless they released Miltiades he would cut them down like pine-trees; and the people of Lampsacus thereupon, when they comprehended the full force of the threat, set the King of the Dolonei at liberty.

The Pines constitute a large genus, comprising more than a hundred species, or about one-third of all known Conifers; and they range geographically throughout the Northern Hemisphere from Borneo and from Mexico (where, on the sides of Popocatepetl, they extend to an altitude of 12,693 feet, the limit of vegetation) to the Arctic Circle. On the Himalayas, Pine woods do not extend above 11,800 feet; but scattered trees are found up to 12,300 feet.

The genus is subdivided according to whether there are two leaves on a dwarf shoot, as in the Scots (*P. sylvestris*), the Corsican (*P. Laricio*), the Cluster (*P. Pinaster*), the Stone (*P. Pinea*), and the Aleppo Pine (*P. Lalepensis*); or three, as in the Pitch Pines of America; or five, as in the Stone Pine of Central Europe (*P. Cembra*) and the Weymouth Pine (*P. Strobus*). Of the first group, the Cluster and Stone Pines have several points in common.





*Cône du Pin Pignon.*

CONE OF STONE PINE.

Der Gneißßbere Fichtenapfel.



In both the needles are long, straight, rigid, and comparatively broad; the cones are large and pointed, and have pyramidal apices in the centres of their rhomboid tessellæ; and the buds are woolly and free from resinous exudations, whilst the scales are reflexed. The two species differ, however, in that *Pinus Pinaster* has, as its name of Cluster Pine indicates, its cones generally in whorls of from three to eight; each cone being not more than two and a half inches wide, and of a brightly polished light-brown; the scales about an inch long and three-quarters of an inch broad, and terminating in a hard, sharp point; and the needles from six to twelve inches long; whilst *P. Pinea* has solitary cones, sometimes four inches wide, of a lighter colour, the scales about two inches long, an inch or more in breadth, and terminating in a broad blunt prickle, and the needles from five to eight inches long.

The Stone Pine may perhaps be a native of China, where it is plentiful, as in the south of Europe it is seldom seen in situations far removed from human habitations. It occurs in the south of France, in Spain, in Greece, and in Barbary; but it is most closely associated in our minds with Italy. The brilliant skies of the landscapes of Claude have their effect frequently heightened by the contrast with its heavy masses of dark foliage. Gilpin is most enthusiastic in its praise:—

“After the cedar,” he says, “the Stone Pine deserves our notice. It is not indigenous to our soil, but, like the Cedar, it is in some degree naturalised; though in England it is rarely more than a puny, half-formed resemblance of the Italian Pine. The soft elime of Italy alone gives birth to the true picturesque Pine. There it always suggests ideas of broken porticos, Ionie pillars, triumphal arches, fragments of old temples, and a variety of classic ruins, which in Italian landscape it

commonly adorns. The Stone Pine promises little in its infancy in point of picturesque beauty ; it does not, like most of the Fir species, give an early indication of its future form. In its youth it is dwarfish and round-headed, with a short stem, and has rather the shape of a full-grown bush than of an increasing tree. As it grows older it does not soon deposit its formal shape. It is long a bush, though somewhat more irregular, and with a longer stem ; but as it attains maturity its picturesque form increases fast. Its lengthening stem assumes commonly an easy sweep. It seldom, indeed, deviates much from a straight line ; but that gentle deviation is very graceful, and, above all other lines, difficult to imitate. If, accidentally, either the stem or any of the larger branches take a larger sweep than usual, that sweep seldom fails to be graceful. It is also among the beauties of the Stone Pine that, as the lateral branches decay, they leave generally stumps which, standing out in various parts of the stem, break the continuity of its lines. The bark is smoother than that of any other tree of the Pine kind, except the Weymouth ; though we do not esteem this among its picturesque beauties. Its hue, however, which is warm and reddish, has a good effect ; and it obtains a kind of roughness by peeling off in patches. The foliage of the Stone Pine is as beautiful as the stem. Its colour is a deep warm green ; and its form, instead of breaking into acute angles, like many of the Pine race, is moulded into a flowing line by an assemblage of small masses. As age comes on its round clumpish head becomes more flat, spreading itself like a canopy, which is a form equally becoming ; and thus we see what beauty may result from a tree with a round head, and without lateral branches, which requires, indeed, a good example to prove. When we look on an Ash or an Elm from which the lateral branches have been stripped, as is the practice in some countries, we are apt to think that no tree with a head placed on a long stem can be beautiful ; yet in Nature's hands, which can mould so many forms of beauty, it may easily be effected."

It is doubtful whether the Stone Pine was grown in England before the time of Evelyn, or even before 1750, about which date Peter Collinson planted it, together with all the Conifers he could collect, at his house at Mill Hill, where many of the trees still remain. After the establishment of the beautiful Pinetum at Dropmore, at the beginning of the present century, the taste for the regular but graceful outlines of the Conifers became general ; but the



Stone Pine is rarely seen with a height of thirty feet in this country.

In the south of Europe its wood is used for masts and general carpentry; but it is chiefly valued for its large edible seeds, which are used as food wherever the tree grows. They are three-quarters of an inch long without their wings, and about half as broad, and, being entirely free from resin, have a sweet taste, resembling that of the Hazel-nut. In Pliny's time they were preserved in honey, and now they are commonly used at dessert, or in sugar-plums, instead of almonds. If not kept in the cone, however, the abundant oil they contain becomes speedily rancid. Besides being much eaten by squirrels, they form the chief food of the Cross-bill, a bird which occasionally visits this country, and whose beak is specially modified for their extraction from the cone.

Where this Pine occurs in large groves of fine trees, such as those which were formerly one of the great beauties of the ancient city of Ravenna, the rustling and sighing of the boughs in the wind has often arrested the attention of the poet. Barry Cornwall thus represents the sighing of a giant as

“With such noise  
As the rough winds of autumn make when they  
Pass o'er a forest, and bend down the Pines;”

and speaks further of “Funereal Cypress, Yew, and shadowy Pine, dark trees,” that

“At night  
Shook from their melancholy branches sounds  
And sighs like death.”

Besides other allusions to the Pines of Italy “shaking their

choral locks," Leigh Hunt specially refers to those of Ravenna in the following lines :—

. . . "the Pine, long-haired, and dark, and tall,  
In lordly right, predominant o'er all.  
Much they admire that old religious tree,  
With shaft above the rest up-shooting free,  
And shaking, when its dark locks feel the wind,  
Its wealthy fruit with rough mosaic rind."





*Le Prunier.*

THE PLUM.

Der Pflaumenbaum.





## THE PLUM.

(*Prunus domestica*.)



OME trees suffer by their associations. Regarding it habitually as a fruit-tree, we are perhaps liable, for instance, to overlook the many other points of interest and the manifold beauty of the Plum. The *Drupaceæ*, including the Peaches, Nectarines, Almonds, Cherries, and Cherry-laurels, in addition to the Plums, are plants which are obviously related by the character of their fruits, and less obviously by other structural peculiarities. They are all woody plants, though varying through a wide range of sizes. They have simple leaves, arranged singly on the nodes of

their stems, generally more or less toothed along

their edges—the teeth often terminating in glands—and having sugar-excreting glands upon their leaf-stalks. The flowers are variously grouped, but are restricted in range of colour, being invariably white, pink, or red. They agree, however, in having typically five parts to both calyx and corolla, and, unlike the Apples, Pears, &c., in shedding both these floral whorls when they have “set seed.” The stamens are numerous in each flower, and rise separately from the margin of a cup or “receptacular tube,” which encloses the ovary without adhering to it, in what is known technically as a “perigynous” manner. The ovary itself consists of a single carpel, terminated above in a well-developed style and stigma and enclosing two ovules, one of which only as a rule reaches maturity as a seed. The “drupe,” or “stone-fruit,” which gives its name to the sub-order, consists of three fairly distinct layers, the outer skin or “epicarp,” the middle pulp or “mesocarp” (which is commonly edible), and the inner “stone” or “endocarp,” enclosing the brown-skinned kernel, or seed. Lastly, many of the trees of the group freely exude a very insoluble gum, especially where their bark is injured; and the foliage and kernels of the entire sub-order contain hydrocyanic, commonly known as prussic, acid.

The Peaches, Nectarines, Almonds, and Apricots, sometimes referred to separate genera as *Persica*, *Amygdalus*, and *Armeniaca*, have woolly skins to the fruit; the Cherry-laurels (*Lauro-cerasus*) have their flowers in racemes, their leaves “conduplicate” (or folded together down the middle) in the bud, and their fruits smooth and polished; the Cherries (*Cerasus*) have their buds and fruits similar to the Cherry-laurels, but their flowers otherwise arranged;

whilst the Plums proper, the genus *Prunus* in the more restricted sense, have their leaves "convolute," or rolled up like a seroll, in the bud, and their fruits covered with a glaucous "bloom" of wax.

Botanists distinguish three varieties of the Common Plum (*Prunus communis*), though perhaps most country-folk would assert the distinctness, even in a wild state, of more than that number. When the bark is black, the branches spreading in all directions, and every twiglet ending in a thorn; when the leaves are finely toothed and smooth beneath; when the flowers come out before the leaves, and have smooth flower-stalks, and when the globular purple fruit does not exceed half an inch in diameter, they term it *Prunus spinosa*, the Blackthorn, or Sloe. When the bark is brown, the branches straight, with few thorns, the leaves broader, with larger and blunter serrations, and downy below; when the flowers and leaves expand at the same time, and the flower-stalks are downy; and when the globular fruit is either yellow or purple, and is nearly an inch in diameter, they call it *Prunus insititia*, the Damson or Bullace. When, lastly, the bark is brown, the branches straight and thornless, the flower-stalks smooth, and the under-surfaces of the leaves only downy along the veins, and when the purple fruit is oblong and over an inch in length, the tree is an escape from cultivation, although termed the Wild Plum (*Prunus domestica*). The Bullace is a larger shrub than the Blackthorn, and the Plum is a small tree, having generally a distinct main stem five or ten feet high.

Though their distinctive characters are not very constant, these forms or "sub-species" differ to some extent in their geographical distribution. The Sloe or Blackthorn

(*P. spinosa*) is confined to Europe; whilst the Bullace (*P. insititia*) extends from the Himalayas and the shores of the Caspian, through Armenia, to the north of Africa and to the south of Scotland. The Plum (*P. domestica*) is either nowhere truly wild, or may be so in Anatolia and the Caucasus, being only naturalised in Europe, and probably of Roman introduction so far as the West, including our own islands, is concerned. In the pre-historic remains from the pile-dwellings in the Swiss lakes, stones of the Sloe and the Bullace occur, but not those of the true Plum.

The close relationship of these forms was early recognised. Thus William Turner, in his "Names of Herbes" (1548), writes :—

"Prunus is called in Greeke Coccimelea, in englishe a plum tree, in duche ein pslaumen baume, in frenche Vun prunier. Prunus sylvestris is called in english a slo tree, or a sle tree."

Though, strange to say, Shakspeare never mentions our native forms under their familiar names of Sloe, Blackthorn, or Bullace, he frequently alludes to cultivated Plums, to Prunes, and once (Second Part of *Henry VI.*, act ii., scene 1) to Damsons; and there can be little doubt that English gardens in his time contained a considerable number of varieties of the fruit. Gerard, in his "Herbal" (1597), says :—

"To write of Plums particularly would require a peculiar volume. . . . Every clymate hath his owne fruite, far different from that of other countries; my selfe have threescore sorts in my garden, and all strange and rare; there be in other places many more common, and yet yearly commeth to our hands others not before knowne."

We cannot but admire the beauty of our common Blackthorn; and yet how often in the early spring do we not





*Fleurs et fruits  
du Prunier.*

FLOWERS AND FRUIT  
OF PLUM.

Pflaumen=blüthe und =frucht.



long to see the last of its beautiful snowdrifts of blossom and of the bitter winds of that "Blackthorn winter" which almost invariably accompanies their presence!

Desolate indeed is the wintry look of its tangle of black thorny boughs and twigs, forming some roadside hedgerow, or in clumps on some bleak hill-side; and desolate does it remain till April, about the middle of which month the blossoms generally appear. From a distance one may then mistrust one's eyesight and wonder if it is indeed a line of lingering snow-drift, brought by the north-east gale of last night, that lies on the slopes of the downs; but on a nearer approach the black boughs can be just discerned, each ending in a rigid spine and clothed in a foamy mass of starry milk-white petals. Then, if the sun glances out between drifting leaden clouds on the snowy branches, as they toss like frothing waves in the blustering breeze, or if the little white-throat be seen dodging amidst the blossom, we forget the presage of inclement weather in the beauty of the plant before us.

When, a few weeks later, its flowers are gone and its leaves appear, the tangled Blackthorn with its strong spines forms a thorough protection to the nests of our feathered friends; and, though perhaps from the resistance which its hard wood offers to the shears, and from its tendency to become straggly, it is not so well adapted for garden hedges as the Hornbeam or Hawthorn, it is both useful and picturesque on the margins of our fields and in our road-side fences. Here, in autumn—

" the ripening Sloes, yet blue,  
Take the bright varnish of the morning dew,"

in silent protest against the partial observation that can

only allude to Sloes as black. The Sloe has at first the purple-blue bloom of the common garden Plum; but as the fruit ripens, though in the Sloe it does not become sweet as in the Bullace and Plum, it loses the bloom of its youth and beauty, and the smooth round balls, pleasing to birds and schoolboys, though contorting the faces of most of their unwary devourers by their astringency, become of a dull blackish-purple. Still they are not black.

At the present day the green-fruited variety of the Bullace (*P. insititia*) is commonly called a Damson; but there can be little doubt that originally this name belonged to some cultivated variety, the fruit of which was worth eating, and which came from the East, nominally from Damascus.

As has been already suggested, the Plum properly so-called may in all probability be the artificial product of cultivation rather than a variety existing anywhere in a truly wild state, and was probably introduced by the Romans, by whom it was undoubtedly cultivated on a large scale. Its name in most modern languages is, therefore, as might be expected, derived from the Latin *Prunus*. Just as the name "Currant" has been extended from the small dried Grapes of Corinth to the Black-, Red-, and White-fruited *Ribes* of our kitchen-gardens, so the name "Plum" has been extended from the fruits of *Prunus* to those of other Grapes, more properly known as Raisins. This extension has probably originated in the long-practised custom of drying both kinds of fruit in the sun. This manufacture, though carried on to a considerable extent in the south of France, from which fact we know the dried fruit mainly as "French Plums," is also



a staple industry in Spain and Portugal, and more especially in Bosnia and Servia.

The cultivated forms of Plum are extremely numerous, the fruit varying in colour, from green, pale yellow or red, up to the deepest purple-black or purple-blue, in shape from globular to an elongated oval or egg-shape, pointed or bluntly rounded at either or at both ends, and in size from less than an inch to between three and four inches in diameter. We can readily believe that some of our larger fruit-eating birds may not unfrequently swallow the stone of the fruit of the Sloe, which they take whole into their mouths, and thus aid in the dissemination of the species; but it would be difficult to imagine this to occur in the case of the Plum. The cultivated forms vary also considerably in the size and shape of the stones and of the kernels they contain; in the flavour of the fruit, its season of ripening, and other points; and so long-established and physiologically engrained have some of these variations become, that they constitute races which will perpetuate their characters by seed. The Greengages, the true Damsons, and the Egg-Plums, for instance, form races that are often true to seed; but as a matter of practice, layering, or, more often, grafting is most commonly used as the method of multiplication.

It is, of course, mainly as a fruit-tree that the Plum is valued; but if it were not so it might well be esteemed for its timber. The very tough and hard wood of the Blackthorn is never of sufficient girth to rank as timber, but it is proverbial, especially in Ireland, as the material for cudgels, and from its suitable size, strength, and abundance, no wood is better adapted for a farmer's walking-stick. The wood of the Plum is of a beautiful

deep crimson colour, and is susceptible of a polish, so that it has been to some extent employed in veneering, and is certainly one of the prettiest timbers that we have.

Though associated with disagreeable weather, the Blackthorn when in bloom is a beautiful and characteristic feature of English landscape that we should be loth to lose; and though the Plum, with its snowy blossoms, creates an impression of chillness in spring, the whiteness is in its case relieved by the admixture of delicate young foliage, suggestive in its verdure of the sunny days that are coming to ripen the pale flowers into warm-tinted fruit.





*Le Buis.*

BOX.

Der Buchsbaum.





## THE BOX.

(*Buxus sempervirens*.)



RECKLESS destruction of both the commoner and the more valuable kinds of timber trees has been, and is, only too frequent in all parts of the world. In not a few cases its effects are already being experienced in an insufficient supply of wood either for general use or for some special purposes. The rapidly increasing demand for the wood of the Box, especially for engraving, and the carelessness in the past as to the Caucasian forests of this timber, have now for some years excited apprehensions among the consumers, and stimulated inquiry as to

suitable substitutes for this material.

The Box (*Buxus sempervirens*) is a member of the large

and mostly acridly poisonous Order *Euphorbiaceæ*, an order in which the flowers are usually small and inconspicuous, destitute of a corolla, and sometimes of a calyx also, and having the sexes divided. The genus *Buxus*, of which our British species is the best known representative, includes less than twenty species of evergreen shrubs, or small trees. Their juice is not milky like that of the allied Spurges (*Euphorbia*); their leaves are either opposite or alternate, leathery and glossy; and the two sexes are borne on the same plant in greenish-yellow flowers. They have a wide distribution through the warmer temperate zones.

Our native species (*Buxus sempervirens*) occurs in Japan, in the Western Himalayas, in Northern and Western Asia, in North Africa, and as far north as Belgium and this country, where, as we shall see presently, there is considerable reason to believe it to be either indigenous, or a denizen the introduction of which dates from a very early period. In a wild state in this country it is seldom more than twelve or fifteen feet high, or, when fully grown, more than six or eight inches in diameter; but in Turkey and Asia Minor, and even in the Jardin des Plantes at Paris, trees thirty feet high and ten inches in diameter are recorded. Such specimens must, however, be at least a hundred years old, as the Box is a very slow-growing plant, rarely making shoots of more than six or eight inches high within the year, and not increasing in diameter more than an inch in ten years. The tree is not only apparently of great longevity, but is so hardy as to be the only evergreen that can withstand the continental cold of the open air of Paris, Berlin, and Vienna without protection.

The young branches, which have generally an upward

direction, are downy and have a smooth, yellowish bark; but the older trunks are rough and grey. The leaves vary from "ovate" to "oblong," *i.e.*, they may be wider across the lower third of their length, or may have parallel sides; they have very short stalks, edged with two lines of minute hairs; they vary in length from half an inch to an inch; their points are rounded or slightly notched; and their colour depends considerably on their age and position. When young they are of a bright grass-green, to which the Box owes the epithets of "greener" and "youthful," as compared to the Holly, in Herrick's verses on "Ceremonies for Candlemas Eve," previously quoted with reference to the Yew (p. 60). This brightness also renders it acceptable, as Herrick's rhymes tell us, for house and church decorations between Candlemas and Easter. When produced in the shade, however, or when grown older, the leaves are of a very dark shade of green, which gives groves of this tree an effect as sombre as that of the Yew itself.

The minute pale-coloured florets appear in April or May, forming crowded spikelets of sessile blossoms in the axils of the leaves. In each spike the lower flowers are staminate, the upper ones pistillate. In addition to minute bracts, each flower is surrounded by a calyx, which in the staminate flowers consists of two alternating pairs of sepals, and in the pistillate flowers of a larger number, commonly six, nine, or twelve, in alternating whorls of three. Similarly, while one kind of flower contains two pairs of stamens and a rudimentary ovary, the other kind has three carpels, united below into a three-chambered ovary, but with distinct spreading styles. The filaments of the stamens are comparatively

long, so that the pollen is very probably carried from the extruded anthers by the wind. The ovary ripens into a dry capsule, about half an inch long, surmounted by the horn-like remains of the three styles; and, when mature, this capsule splits into three valves, each formed of two adherent half-carpels, so that each of the styler horns splits longitudinally. There are two black seeds in each chamber of the ovary.

The largest numbers of wild Box trees in Europe occur in France, in the Forest of Ligny, at St. Claude, in the Jura, and in the Pyrenees; but in these localities it is more mixed with deciduous trees than is the case where it occurs in England. A large proportion of the Boxwood of commerce, shipped from Odessa and Constantinople, is the produce of a distinct species, *Buxus balearica*, a native of Minorca, Sardinia, Corsica, Turkey, and Asia Minor, first introduced into England in 1780, which grows in its native countries to a height of as much as eighty feet.

A great deal has been written as to the claim of the Box to rank as an indigenous tree in England. Judging from such place-names as Boxley, Boxmoor, &c., it would seem to have been at one time more abundant than now, and at least of very early introduction. These names, of which the last-mentioned, in Hertfordshire, may be merely a corruption of Bogsmoor, all belong to places on the chalk or limestone hills of southern England, and there is nothing in the continental distribution of the plant altogether fatal to its being native here. But, as in the case of Sir Roger de Coverley and the Saracen's Head, much may be said on both sides. A century ago the Hon. Daines Barrington laid down a three-fold test of the truly indigenous character of any species of tree: that such trees grow in large





rs et fruits  
u Buis.

BOX FLOWERS AND  
FRUIT.

Buchsbauu=blütbe  
und =frucht.



masses, and spread over a considerable breadth of surface ; that such masses never end abruptly, except where there is a sudden change in the soil or the substratum ; and that the trees ripen their seeds readily, and that when these seeds are dropped they spring up freely. Tried by these tests he decided the Chestnut, Lime, Common Elm, and Box to be introduced species, whilst he considered the Sycamore, White Poplar, Yew, Spindle-tree, and Privet to be only doubtfully native.

“The Box,” he says, “is not mentioned by Gerard, and . . . is found nowhere in an apparently wild state, except on Box Hill, where it was planted by Lord Arundel, who designed to build a house there, but who relinquished his intention from the want of water.”

In opposition to these arguments it may be urged that some trees, such as the Lime, Spindle-tree, and Yew, even in countries where they are undoubtedly indigenous, seldom occur in large masses ; whilst the annual ripening of fertile seed would very probably cease near the margin of the geographical range of a species. As to the Box, it is mentioned both by Gerard and by Turner. The former speaks of it as growing on various wild and barren hills in England ; but the latter, who, however, was not very familiar with our south-eastern counties, says,

“It groweth on the mountains in Germany plentifully, wild, without any setting ; but in England it groweth not by itself in any place that I know, though there is much of it in England.”

Parkinson (1640) writes that it is found in many woods ; but a still earlier writer, Lambarde, whose “*Perambulations of Kent*” in 1570 were published in 1576, is a more important witness, and one whose evidence cannot be said to be gainsaid by the fact that a corres-

pondent of the "Gentleman's Magazine," 200 years later (vol. lvii., 1787), "was thoroughly convinced, from the strictest inquiries," that the Box was not wild at Boxley, in Kent. Ray says :

"The Box grows wild on Box Hill, hence the name; also at Boxwell, on the Cotswold in Gloucestershire, and at Boxley in Kent, where there were woods of this tree, according to Aubrey. It grows plentifully on the chalk hills near Dunstable."

As to Box Hill, the most conclusive evidence has been brought forward of late years. Not only did this land never belong to the Earl of Arundel, who died in 1646; but the names of Adam de Buxeto and Henry de Buxeto occur as witnesses to charters in connection with this neighbourhood as early as the reigns of John and Henry III. In 1602, the owner, Sir Matthew Brown, leased a warren and its lodge, which were then at that place, to Thomas Constable, the tenant covenanting to preserve the Yew, Box, and all other trees growing thereupon, and to deliver a half-yearly account of what shall be sold. Accordingly, in 1608, we get a return, showing £50 worth of Box trees to have been cut in that year. During a few years preceding 1712 trees were felled to the value of £3,000, and at the close of the last century the lord of the manor, Sir H. P. St. John Mildmay, sold all the Box upon the hill of more than twenty years' growth for £10,000.

De Candolle points out that the name of the tree, which at first sight appears so indubitably of Latin origin, has its analogues not only in Slavonic but also in Keltic and even Tartar languages. The Greek *Pyros*, Latin *Burus*, French *Buis*, and German *Buchs*, are at least traceable in



the Illyrian *Bus*, the Breton *Beuz*, the Calmuck *Boschton*, and the Georgian *Bsa*; so that the Box may have been carried westward with the earliest migrations of the Indo-European races, or have been found indigenous by them and given a name previously used by their common ancestors.

On the other hand the Box does not occur in the Channel Islands or in Ireland, whilst in Holland, Belgium, and the north of France it grows mainly in hedgerows and in the immediate neighbourhood of cultivation. Its introduction at a date which is at least remote would seem to be indicated by the fact that a sprig of Box forms the badge of the clan M'Intosh, and one of its variegated form that of the M'Phersons.

The Romans employed the Box both when growing for "topiary" work, and as timber. Both Pliny and Vitruvius allude to the clipping of the shrub into hedges ornamented with the figures of animals, whilst Virgil and Ovid refer also to the use of its wood for musical instruments, employing the word *Buxus* as meaning a flute. It may, therefore, well be to them that we owe the introduction of the tree into England.

The wood is remarkably heavy, being the only European timber that will sink in water; it is yellow, very hard, compact, and even-grained, so as to be susceptible of a fine polish; it is, as Dryden describes it, translating Virgil—

"Smooth-grained, and proper for the turner's trade,  
Which curious hands may carve, and steel with ease invade."

It is still employed, both here and on the Continent, for a variety of purposes besides wood-engraving, for which art, however, the finest quality of Boxwood is

mainly reserved. It is used in inlaying, for mathematical instruments, especially foot-rules, for weaving-shuttles, and other turned articles. Some of these, however, are made at St. Claude, not from the stem, but from the root, the wood of which is often beautifully veined.

The art of wood-engraving is older than that of printing, the old block-books, such as the "Biblia Pauperum" of the first half of the fifteenth century, being engraved on a series of large blocks. It is, however, only since the time of Bewick that wood-engraving has become general as a means of book illustration; and possibly the introduction of the many photographic and electrotypic processes now in vogue may afford a solution of the difficulty as to the supply of Boxwood in the future. Some Boxwood can, undoubtedly, be procured from India and the Cape; and of the various substitutes suggested, whilst our own Hawthorn seems the best, Pear, the American Dogwood (*Cornus florida*), the Texas Ebony (*Diospyros texana*), and the West Indian Trumpet-flower (*Tecoma pentaphylla*) all promise to prove useful.





*Ornille.*

WYCH ELM.

*Rüster.*







## THE WYCH ELM.

(*Ulmus montana*.)



HETHER a particular tree is or is not indigenous is often, as we have more than once had occasion to see, a difficult question to decide. One of the most difficult cases is that of our common Elm (*Ulmus campestris*). Elm wood, though above the average in durability, has not been recognised in our submerged forests, or in pre-historic works in wood; but few places take their name from the Elm; and our commoner species in the south of England is a hedgerow rather than a forest tree, and seldom ripens its seed in this country. The evidence points,

indeed, to the introduction of this species by the Romans. The Wych Elm, however (*U. montana*), has far more

irrefragable claims to be considered one of our native trees. Though more abundant to the north of the Trent, it is, wherever it occurs, less distinctly a hedgerow tree than its congener, bearing out its name *montana*, the Mountain Elm, which seems to have been applied to it in very ancient times. It produces seed freely even in Scotland, being, in fact, often known as the Scotch Elm; and, not producing suckers like the common Elm, it depends entirely upon its seed for the perpetuation of the species. Lastly, in addition to the forty places mentioned in "Doomsday" with names derived from that of the Elm, it must be remembered that the Wych Elm was formerly known, even more commonly, as the Wych Hazel, and may accordingly have given rise to some of the names apparently due to the true Hazel.

The name Wyeh is of uncertain origin. Turner uses it alone. In his "Names of Herbes" (1548), he says:—

"Vlmus is called in greeke Ptelea, in englishe an Elme tree, or a Wich tree, in duche ein vlme baume, or Ylmen or Rust baume, in frenche Orme."

From the resemblance of the name—which is indeed not infrequently written "Witeh"—the tree has been considered a preservative against witchcraft, and in the midland counties a small piece of its wood used accordingly to be let into the churns, under the belief that without it the butter would not come.

The name, like that of the Common Elm, is applied to a number of tolerably distinct forms rather than to a well-marked typical species. These forms all agree in producing no suckers; their branches are usually pendulous; the "samara," or winged seed-vessel, is more or less elliptical, with the seed-cavity below the middle, and the

seed is fertile. Though characters like that of the position of the seed-cavity in the fruit appear trivial to the unbotanical, they are often, as in this case, the most readily detected; and when we become familiar with the general appearance of growing plants such distinctions are often borne out by differences which it is more difficult to describe in words. The Wych Elms do not grow to quite so great a height as the Common Elms, though they equal them in girth. In some forms the bark is corky, but not in others; but in all the twigs are usually downy, and the leaves for the most part large, coarsely and irregularly toothed, and unequally or "obliquely" rounded at the base. The leaves thus closely resemble those of the Hazel, from which fact the tree obtained its old name of Wych Hazel.

The typical form of the Wych Elm has a smooth thin bark, and does not throw out heavy horizontal limbs, like the Common Elm. It flowers, too, rather earlier than the latter, and its samaras form conspicuous pale green, hop-like clusters on the otherwise bare boughs in April, before the appearance of its leaves. The stem is often of no great height, though attaining a large girth; and from the main ascending limbs numerous twiggy branches wave pendulously with a very pleasing effect when partly clothed by the unripe fruits or by the young leaf-buds in their tender greenery, whether the tree overhangs some steep-banked lane or stands isolated in a park. Gilpin says of it, that it

"is, perhaps, generally more picturesque than the common sort, as it hangs more negligently, though, at the same time, with this negligence it loses in a good degree that happy surface for catching masses of light which we admire in the Common Elm. We observe, also, when we see this tree in company with the Common Elm, that its bark is somewhat of a lighter hue."



Commenting on this passage, Sir Thomas Dick Lauder remarks :—

“ We are disposed to think that Mr. Gilpin hardly does justice to this Elm. For our parts, we consider the Wych or Scottish Elm as one of the most beautiful trees in our British sylvæ. The trunk is so bold and picturesque in form, covered, as it frequently is, with huge excreseences; the limbs and branches are so free and graceful in their growth; and the foliage is so rich, without being leafy or clumpy as a whole; and the head is generally so finely massed, and yet so well broken, as to render it one of the noblest of park trees; and when it grows wildly amid the rocky scenery of its native Scotland there is no tree which assumes so great or so pleasing a variety of character.”

It must perhaps be admitted that at midsummer all Elms are dull in colour, and not seldom heavy in outline. It is in spring and autumn that they are of most picturesque value in the landscape; and it is important that the beauties presented by them and by other trees at these seasons should be recognised alike by the artist and by the landscape gardener. The tree planter has the immense advantage over the painter that his materials are already blended by Nature; and imagination can suggest few colour effects more harmonious than those she presents in the vinous tufts of staminate flowers on the boughs of the Elm in March, its pale green fruit clusters a little later, or the October change to a clear lemon-yellow spreading from bough to bough, each leaf paling to a pellucid grass-green as the autumnal tint encroaches upon its margin.

The Wych Elm grows more rapidly than the Common Elm, and its wood is consequently far inferior in hardness and compactness, besides being more liable to split. Statements to the contrary have arisen from the confusion in Scotland and the north of England of the spongy-timbered





*fleurs, et feuilles  
de l'Orme.*

FRUIT, FLOWERS, AND LEAVES  
OF WYCH ELM.

Frucht, Blüthe, und  
Blätter der Rüster.



Cork Elm (*U. suberosa*) with the true Common Elm (*U. campestris*), which, as has been already stated, occurs but rarely north of the Trent. The wood of the Wych Elm is, however, tough, straight-grained, and, when steamed, flexible, so that it is employed by boat-builders and cartwrights, and in making pumps. As it does not splinter, but becomes smooth from constant wear, it is also sometimes used for rollers, for the handles of spades, &c., and for wheel-barrows; whilst the excrescences on the stems are valuable for veneering. Gerard tells us that formerly long-bows were made from the wood of this species, and its tough bark was made into ropes.

Among the chief varieties belonging to this group of the Elms—most of which are remarkably distinct in appearance—are the Downton, Exeter, Chichester, Canterbury, and Dutch Elms, and a form which may perhaps be fitly known as the Essex Elm.

The Downton Elm (*U. montana pendula*) is the variety commonly grown in our London squares and gardens, grafted on the ordinary Wych Elm. It was raised from seed from a Nottinghamshire tree at Worcester in 1810, and grown at Downton Castle, in Herefordshire, from which it takes its name. Its leaves are dark in colour, large, and somewhat closely set—so that, when large, the tree has sometimes a rather sombre effect; but its drooping boughs form many a pleasant arbour, and a row of specimens of this variety overhanging the River Ouse in the churchyard of Newport Pagnell are exceedingly beautiful.

The Exeter Elm (*U. montana exoniensis*), occasionally seen in nursery gardens, is simply a “fastigiata” variety, having the leaves set closely round the erect branches. It

has all the effect of an abnormal or monstrous form, without any redeeming beauty.

The Chichester Elm (*U. montana vegeta*), though it may have originated more than once, was raised in 1746 by Wood, a nurseryman at Huntingdon, from seed collected in the neighbourhood. It is variously known as the Huntingdon, Scampston, or unfortunately as the American Elm, though it is, of course, quite distinct from the species (*U. americana*) with its fruits fringed with hairs, to which that name properly belongs. It is valuable as a timber-tree, and is of remarkably rapid growth, often sending up shoots six or ten feet long in a single season, and making a total growth of as much as thirty feet from the graft within ten years. According to Selby, there are many fine old specimens referable to this form in the counties of Huntingdon and Nottingham.

The Canterbury Elm (*U. montana superba*) was raised by the late W. Masters in his nursery at Canterbury, and distributed under the name of *U. montana major*—a name likely to lead to confusion with the Dutch Elm, the *U. major* of Sir J. E. Smith. The Canterbury seedling has very large leaves, and is of rapid growth, but is of no proved value as a timber tree.

The Dutch Elm (*U. hollandica*) has perhaps more claim than any of those just mentioned to rank as a distinct species; but it seldom matures its seed. It was introduced by William III. for clipped hedges, on account of its rapid growth. It has branches which spread almost as widely as those of the Common Elm, and the bark of which, at first smooth, becomes afterwards more corky than that of any other Elm, not excepting the form known as the Cork Elm (*U. suberosa*). The leaves are large and coarse; and



the calyx-lobes and stamens each four in number, instead of the more frequent five. Many of the Elms near Kensington Palace belong to this variety; but except for its handsomely-furrowed bark and rapid growth, it has not much to specially recommend it, as its rapidity of development renders it liable to the defect known as "star-shake," which makes it less fit for boat-building or other uses.

The variety which, it is suggested, from its abundance in that county, may be known as the Essex Elm (*U. nitida* of Syme, or *U. elegans* of Edward Forster's MSS.), forms fine straight-stemmed trees with gracefully curving but only slightly pendulous boughs, and with leaves which are not very large, but smooth and shining, of a dark shade of green, and with a tapering point and regularly serrate margin, somewhat resembling in their elegant outline the foliage of the Hornbeam.

All these forms are classed as Wych Elms, from the seed-cavity in their samaras being below the centre, and several of them are worth consideration by the tree-planter. Like various foreign species, they are commonly grafted upon the hardy typical Scotch Elm, which is itself mainly reproduced from seed. As a park tree, no variety excels this typical form, which is seen to the best advantage when standing alone, as the drooping boughs are then able to display all their natural grace of curvature.

There are many fine specimens of this tree in the Lowlands of Scotland, and in various parts of England; but, from confusion of nomenclature, the Wych Elm is hardly distinguished from the Common Elm by the majority of Continental observers. At Ashted Park, Surrey, there is a magnificent tree, said to date from the time of William

Rufus. Its massive, though now much decayed, trunk, and lofty wide-spreading limbs, produce in the mind of the lover of trees a re-echo of Allan Quatermain's apostrophe :—

"I do love a good tree," he says. "There it stands so strong and sturdy, and yet so beautiful—a very type of the best sort of man. How proudly it lifts its bare head to the winter storms, and with what a full heart it rejoices when the spring has come again! How grand its voice is, too, when it talks with the wind: a thousand *Æolian* harps cannot equal the beauty of the sighing of a great tree in leaf. All day it points to the sunshine and all night to the stars, and thus passionless, and yet full of life, it endures through the centuries—come storm, come shine—drawing its sustenance from the cool bosom of its mother earth, and, as the slow years roll by, learning the great mysteries of growth and of decay. And so on and on through generations, outliving individuals, customs, dynasties—all save the landscape it adorns and human nature—till the appointed day when the wind wins the long battle and rejoices over a reclaimed space, or decay puts the last stroke to his fungus-fingered work. Ah! one should always think twice before one cuts down a tree!"





*Poirier.*

PEAR.

Birnbaum.





## THE PEAR.

(*Pyrus communis*.)



PRING, with the bursting of green leaf-buds and the joyous opening of many blossoms, is essentially the season of hope. All Nature seems to rejoice in its birth to a renewed life, promising the warmth of colour and sunshine in the coming summer, and the harvest of ripened fruits in autumn; and man reverberates to the notes of gladness, seeming to feel the very rising of the sweet sap in his quickened pulse and lightened heart. The colours of summer have not yet come; many of the trees put forth their blossoms, as it were, prematurely upon leafless boughs, and those blossoms

are often of a chilly whiteness that might be expected to

This last-mentioned form, with leaves which are almost smooth and are heart-shaped at the base, and very small globose, apple-like fruit, is most interesting, as occurring in a wild state in Devonshire, Cornwall, and Brittany, and as, in the opinion of competent authorities, being perhaps the "apples" of the "Inis yr Avalon"—the Isle of Apples in the Arthurian traditions.

Pliny describes the varieties of Pear in cultivation in his time as exceedingly numerous, including both early and winter sorts; whilst Gerard says of them:

"The stoeke or kindred of Pears are not to be numbered; every country hath his peeculiar fruit, so that to describe them apart were to send an owle to Athens, or to number things that are without number."

He does, however, enumerate seven sorts, all of which, he says, and many more sorts of

"tame peares, most rare and good, are growing in the ground of Master Richard Pointer, a most cunning and curious graffer and planter of all manner of rare fruits, dwelling in a small village neere London, called Twicknam; and also in the ground of an excellent graffer and painful planter, Mr. Henry Banbury, of Touthill Street, neere Westminster; and likewise in the ground of a diligent and most affectionate lover of plants, Mr. Warner, neere Horseydowne, by London."

Among the Pears of the sixteenth century were the Popering Pear, mentioned by Mercutio in *Romeo and Juliet*, probably a Flemish variety, named from Popering in Flanders, and possibly introduced by Leland the antiquary, who was made Rector of Popering by Henry VIII.; and the Warden or Lukewards Pear. This last-mentioned variety seemingly originated in the horticultural skill of the Cistercians of Warden Abbey, in Bedfordshire, which was founded in the twelfth century. Three of these fruits





*Fleurs du Poirier.*  
*Poire.*

PEAR - BLOSSOM.  
PEAR.

Birnblütze.  
Birne.





appear in the arms of the Abbey. They were probably called Lukewards from ripening about October 18th (St. Luke's Day), and were eaten in the "Warden pies" coloured with saffron (as we now colour stewed Pears with cochineal), to which allusion is made in *A Winter's Tale*. More than two hundred and fifty sorts were known at the end of the last century, and nearly seven hundred in 1831.

In a wild state the Pear is but a small tree, sometimes a mere shrub, more often twenty feet high than forty; but its rough bark, its upright growth and pyramidal shape, with pendulous boughs, give it a grace that does not belong to the more straggling Apple-tree, though the rosy blossoms of the latter may be more attractive than the wan bloom of its congener. The branches of the Wild Pear, like those of the Wild Plum, are generally spinous, and they spring from the main stem in an ascending manner at an angle of less than forty-five degrees, afterwards curving outwards and downwards. The leaves are scattered alternately along the young shoots, but crowded together in bunches or "fascicles" on the old wood. Country-bred folk learn to distinguish at a glance the leaves of the Pear from those of the Apple. The leaves of the Pear are generally on a longer and more slender stalk than those of the Apple, and are consequently more pendulous. Speaking only of our wild forms, they are also slightly smaller, not exceeding one and a half inches in length. They are sometimes heart-shaped at the base, and vary in general outline from "ovate," *i.e.* broadest near the base, through "oblong," *i.e.* with approximately parallel sides and broadest across the centre, to "obovate," *i.e.* broadest near the point. On young trees

the leaves are often lobed, as in the allied Service-trees, and in all cases they are at first pubescent, at least on the under surface. They vary, however, in different soils, especially on the Continent, where those of several of the mountain forms are as white on their under surfaces as those of the White Beam (*P. Aria*), and the form is sufficiently variable to acquire such names as "Willow-leaved" and "Sage-leaved" for some of the varieties. The leaves are always acutely pointed, though the apex varies from an abrupt point ("cuspidate") to a long and tapering one ("acuminate").

By about the middle of April the Pear-trees of our suburban orchards ought, in favourable seasons, to spread over the landscape the snowy sheet of their full bloom. The flowers, however, continue for some time, lasting generally until about the middle of the following month, thus preceding the warmer-tinted Apple-blossom by about a fortnight. In this month the young foliage has made rapid strides, so that, though the flowers of the Pear are as "precocious" in their first appearance on the bare branches as those of the Blackthorn, the white mass of bloom is soon relieved by a delicate background of tender green. The flowers are grouped in flat-topped, or "corymbose" clusters, and each one of the bunch is an inch or an inch and a half across—the same size, that is, as those of the Apple, from which they are technically distinguished, not by their colour, but by having their styles distinct to the base instead of being united below. This union, of course, takes place later, when the so-called "calyx-tube" binds together the five carpels into a single Pear. As the study of the not uncommon specimens of abnormal fruits shows, this structure, which is essentially nothing more than an

expansion of the flower-stalk or "floral receptacle," contributes far more largely to the fruit than is the case in the Apple. It grows first as a thickened cylinder below the flower, and then expands in a globular form around the five carpels or "core" which it imbeds. This "core," it should be observed, occupies a higher relative position—*i.e.*, is further from the stalk—in the Pear than in the Apple. The outline of the fruit, tapering gradually, as it generally does, into its stalk, though very characteristic of the Pear, is no more absolutely so than is the depression into which the stalk is usually inserted in Apples. A more universal distinction in structure between the fruits of the two species is the presence in that of the Pear only of the well-known "grittiness," due to small clusters of cells, thickened with woody deposits in their walls, which are scattered throughout the fleshy part of the fruit. Few Wild Pears produce fruits one quarter the size of the common cultivated varieties; nor does their texture or flavour render them fit to eat.

In some favourable autumns the Pear exhibits beauties that perhaps surpass those of the pure white and virginal green of spring, its leaves turning to a vivid crimson. Though the tough and indestructible character of its fallen leaves may render the Pear undesirable on a lawn, it well deserves for its beauty alone a place in the cottage-garden, the farm-enclose, or the shrubbery. Few more delightful surprises await us in our rural walks than to come upon a well-grown Pear-tree standing apart in a small woodland clearing, whether it be decked in the snow of spring or the crimson of autumn.

Of our three wild varieties, none of which can be termed common, *P. Pyramidalis* has "acuminate" leaves,

which, though downy beneath when young, become smooth, and a typically pear-shaped or “turbinate” fruit, tapering gradually into its stalk; *P. Achras* has broader leaves, more abruptly pointed, which always remain downy or flocculent below, and a more globular fruit, rounded at its stalk end; whilst *P. Briggsii*, as has already been stated, has almost smooth “cordate” leaves, and a very small globose fruit.

The wood of the Wild Pear is heavy, strong, compact, fine-grained, and of a reddish-brown tint. Though inferior to Box and Hawthorn for engraving, it has long been used for this and kindred purposes. Gerard says it

“likewise serveth to be cut into many kindes of moulds, not only such prints as these figures are made of, but also many sorts of pretty toies, for coifes, breast-plates, and such like, vsed among our English gentlemen.”

It is commonly employed for T-squares and other drawing instruments, and is said to be excellent as fuel, and to yield good charcoal.







*Cyprès.*

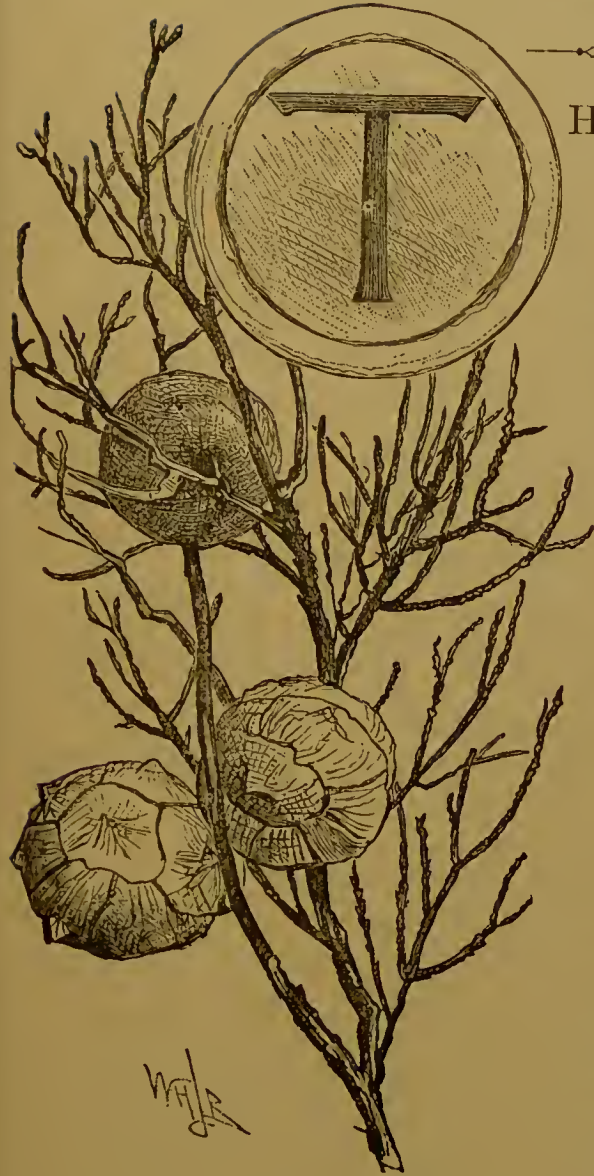
CYPRESS.

*Cypresse.*



## THE CYPRESS.

(*Cupressus sempervirens*.)



THE associations of some trees are ineffaceable. Though neither in form nor in colour has the Cypress any suggestion of grief or gloom to the dweller in northern Europe who may be ignorant of its name and history, the customs and language of ages have, in its own southern climes, indelibly impressed upon it the symbolism of bodily death and spiritual immortality.

The Cypress (*Cupressus sempervirens*) is generally a flame - shaped, tapering, cone-like tree, with but a short stem below its branches, which rise erectly and close to the trunk, much as in the Lombardy Poplar.

Even in its native country it seldom exceeds fifty or sixty feet in height; and in our climate its average rate of growth

is from a foot to eighteen inches per annum for the first eight or ten years, and after that it lengthens more slowly, so that trees forty years of age are seldom as many feet in height. After reaching a height between thirty and forty feet its growth is often almost imperceptible. Nevertheless, the largest specimens in England have reached considerably larger dimensions. At Stretton Rectory, in Suffolk, a tree was sixty-three feet in height in 1835, with a stem two feet in diameter; whilst in the climate of Devonshire, which is peculiarly favourable to this class of tree, a specimen is recorded by Loudon, at Kenton, which had reached that diameter and a height of sixty feet in thirty-eight years. Probably the oldest Cypresses in England are those at Syon House, which are believed to have been planted by Turner before 1548. One of these is over fifty-two feet high, and one foot three inches in the diameter of its trunk and eight feet in that of its head. Turner dates the dedication to Somerset of his "Names of Herbes" "From your graces house at Syon, Anno Dom. MCCCCxlviii, Martii xv," and in that work he writes:—

"Cupressus is named in greeke Cyparissos, in englishe a cypresse tree. Cypresses growe in great plentie in my Lordes graces gardine at Syon."

About fifty years later Gerard speaks of the Cypress as well known to most people, but specifies Syon, Greenwich, and Hampstead as places where it then grew; so that this is not inconsistent with its having been brought from Italy by Turner.

The dimensions of the species in southern Europe vastly surpass our largest examples. Thus one at Monza, in Italy, known to be 150 years old, is recorded as ninety feet high, two and a half feet in diameter of the stem, and



twenty feet in that of the tree. By far the largest and oldest Cypress in Europe, perhaps the oldest living tree of any kind, is the historical and gigantic tree at Soma, in Lombardy. It is popularly supposed to have been planted in the year of the birth of Christ, and is looked upon with great reverence in consequence; but there is said to be documentary evidence that it was a tree more than forty years earlier. It is more than 120 feet in height, and its stem is twenty-three feet round. In addition to the interest arising from this great age and size, the tree has the distinction of having been wounded by Francis I., who is said to have struck his sword into it in despair after his defeat at Pavia; and of having been so respected by Napoleon that in planning his road over the Simplon he deflected it from the straight line to avoid injuring the tree.

The branches of the Cypress divide repeatedly, and approximately in a single plane, so as to form flat, frond-like sprays, the smaller twigs of which are quadrangular in section and are closely covered with small overlapping leaves in four rows; these are of a yellowish shade of green, with a smooth and shining curved surface, and remain on the tree for five or six years, spreading outwards and becoming more sharply pointed as they get older. On the main stem the leaves are longer and needle-like.

As in most members of that main division of the *Coniferæ* that is known as the *Araucariaceæ*, the male and female flowers of the Cypress are produced on the same tree. The staminate flowers are very numerous, and are only about a quarter of an inch long. Each of them consists of an elongated cone or axis, bearing the male

“sporophylls” or staminate leaves, minute scales of a yellowish colour, each bearing three pollen-sacs. The female flowers are fewer in number, each being a globose, or rather polyhedral, cone made up of about a dozen polygonal scales with a conical projection in the centre of each and a number of erect ovules at the base of its inner surface. When mature, this cone or “galbulus” is from an inch to an inch and a half in diameter, and its scales become corky externally and woody within, and separate to allow the seeds to drop out.

The wood of the Cypress is hard, remarkably fine and close in grain, very durable, of a beautiful reddish-brown colour, and resinously fragrant. The evergreen character of the tree, and perhaps its flame-like monumental outline, the durability of its timber, and its wholesomely balsamic odour, have no doubt jointly contributed to that symbolism which Spenser summed up by speaking of it as “the Cypresse funerall.” As Horace says, whatever was thought worthy to be handed down to the most remote posterity was by the ancients enclosed either in Cypress or in Cedar wood. The Gopher-wood of which the Ark was constructed is supposed by some to have been Cypress, and Herodotus tells us that the Egyptians used Cypress-wood for their mummy-cases; whilst Thucydides mentions that it was specially reserved to contain the ashes of those Greeks who died for their country, and Plato directed that his code of laws should be engraved on Cypress-wood, as being more durable than brass. Theophrastus states that the tree grew wild in the island of Crete on snow-covered mountains, and in Cyprus; and that it would not grow in too warm a situation. He recommends those who wish to grow it successfully to



*Pommes du Cypres.*

CONES OF THE CYPRESS.

*Cypressen=apfel.*





obtain some of its native soil from Cyprus; and says further that it was dedicated to Pluto because, when cut down, it, like other Conifers, never throws up suckers. This may perhaps be connected with the custom of burying branches of Cypress with the dead, though more probably this, like the modern Turkish practice of planting the tree at either end of their graves, arose from the belief that the aroma of its resin would neutralise the effluvia of the cemetery. So wholesome was this aroma considered, that Oriental physicians were in the habit of sending patients with weak lungs to the isle of Crete. The bridge built by Semiramis over the Euphrates is said to have been of Cypress-wood. Pliny narrates several remarkable, but not incredible, instances of the durability of Cypress-wood. He says that there were in his time Cypresses still standing at Rome which were more ancient than the city itself; but that the tree was not a native of Italy, having been originally introduced from Greece to the Greek colony of Tarentum; whence, indeed, Cato, in his work on "Rural Economy," recommends that its seed should be procured. The doors of the temple of Diana, at Ephesus, were, Pliny relates, of Cypress-wood, and appeared quite new when four centuries old; as did also the statue of Jupiter in the Capitol, which was of the same material and half as old again. The tree in his time was employed for rafters, joists, and especially for vine-props, so that a Cypress grove was thought a valuable dowry for a daughter. The Cypress was also one of the trees tortured into various shapes with the shears in that "topiary" work which was as fashionable in the Roman villa of the first century as in the English, French, or Dutch garden of the seventeenth. The wood of the Cypress may have been one of several kinds of timber

marked with ornamental knots and wavy figures in the grain which, under the name of Citron-wood, were most highly prized by the Romans for the manufacture of tables known as "*mensæ tigrinæ et pantherinæ*." From mediæval times the coffins of the Popes have been made of Cypress-wood, at least in part; and it is related that the doors of St. Peter's, made of this wood, lasted without decay from the time of Constantine to that of Pope Eugenius IV. in the fifteenth century. Evelyn mentions many uses to which the wood was put:—

"What," he says, "the uses of this timber are for chests and other utensils, harps, and divers other musical instruments (it being a sonorous wood, and therefore employed for organ-pipes, as heretofore for supporters of vines, poles, and planks, resisting the worm, moth, and all putrefaction, to eternity), the Venetians sufficiently understood, who did every twentieth year, and oftener (the Romans every thirteenth), make a considerable revenue of it out of Candy. . . . There was in Candy a vast wood of these trees, belonging to the republic, by malice or accident, or, perhaps, by solar heat (as were many woods, seventy-four years after, here in England), set on fire; which, beginning 1400, continued burning seven years before it could be extinguished; being fed by the unctuous nature of the timber, of which there were to be seen at Venice planks above four feet broad."

There can be little doubt that the Cypress was originally a native of Asia Minor, and probably also of the island of Cyprus, from which it almost certainly derives its name. It may perhaps be doubted how far the legends versified by Ovid in his "*Metamorphoses*" are due to original mythologising by the poet on his own account, and how far they represent popular belief; but the story of the origin of the Cypress, according to Ovid, is somewhat as follows:—A beautiful deer, a pet of Apollo's, used to come every day to be fed either by the god or by his faithful attendant, a youth named Cyparissus; but one

day, as it came bounding from the forest towards Cyparissus, he, by mischance, killed it with a javelin which he was hurling in sport. So great was the boy's grief at the accident that Apollo could not console him. He flung himself on the ground in despair, as the conclusion of the story has been translated,

“Praying in expiation of his crime  
Thenceforth to mourn to all succeeding time.  
And now, of blood exhausted, he appears  
Drain'd by a torrent of continual tears.  
The fleshy colour in his body fades,  
A greenish tincture all his limbs invades.  
From his fair head, where curling ringlets hung,  
A tapering bush, with spiry branches, sprung,  
Which, stiffening by degrees, its stem extends,  
Till to the starry skies the spire ascends.  
Apollo saw, and sadly sighing, cried,  
'Be, then, for ever what thy prayer implied:  
Bemoan'd by me, in others grief excite,  
And still preside at every funeral rite.' ”

The last line refers to a Cypress-tree being placed at the door of a Roman house where a dead body was lying.

Though every cemetery in the East is thickly planted with Cypresses, the tree has none of that almost necessary mental suggestion of sadness which pertains to the mode of growth of the Weeping Willow or the sombre hue of the Yew. It is, in fact, a very pleasant and ornamental ever-green, with the somewhat formal but unusual outline that renders it suitable for planting singly or in rows, especially where space is limited. It cannot withstand the severe winters of northern France or Germany; but with us it ripens its seed freely, and, as has been seen, grows almost as rapidly, if not to so large a size, as in its native land.

It cannot, however, endure the smoke of towns so well as the Lombardy Poplar or as the Arbor Vitæ. It is not particular as to soil, but flourishes best in one which is deep and sandy, and therefore somewhat dry and warm, and in sheltered situations, not, in our latitudes, very much above sea-level. To see Cypresses flourishing most luxuriantly in England one should visit the sheltered sandy combes facing the sea in South Devon, as at Ivybridge or Salcombe, where they seem as much at home as in Candia itself. Until it reaches a considerable age the Common Cypress is, however, somewhat too stiff in outline for our modern taste in gardening, so that it is now being replaced by the more free-growing species from North America and Asia, especially the now much and deservedly admired *Cupressus Lawsoniana*.





## GENERAL INDEX.

---

Abele or White Poplar, I. 59, 60  
 Acacia, The, II. 9; introduction of, II. 9; Timber, II. 10; uses of, II. 10; range of, II. 13; Bark of, II. 14; Leaves of, II. 14; Flowers of, II. 15; fine specimens of, II. 16  
 Acorns, Holm or Evergreen Oak, I. 101; Oak, I. 6.  
 Albespine, I. 147  
 Alder, The, II. 65; range of, II. 65; size of, II. 66; Bark of, II. 67; Wood of, II. 68; uses of, II. 68; Catkins of, II. 70; Foliage of, II. 71  
 Alder Buckthorn, II. 69  
 Aleppo Pine, II. 116  
 Almond-leaved Willow, I. 94  
 Apple, The, I. 25; distribution of, I. 25; Blossom of, I. 25; distinctive features of, I. 30; Fruit of, I. 30.  
 Apple, Oak, I. 7  
 Artichoke-gall on the Oak, I. 7  
 Ascham, Roger, on the Yew, II. 62  
 Ash, The, II. 89; range of, II. 89; Bark of, II. 91; height of, II. 91; traditions of, II. 91; distinctive features of, II. 92; Leaves of, II. 93; Flowers of, II. 93; remarkable Tree, II. 95; Wood of, II. 95; uses of, II. 95  
 Aspen, The, I. 59, 60; II. 81; distinctive character of, II. 81; growth of, II. 81; Wood of, II. 82; size of, II. 82; Bark of, II. 83; range of,

II. 83; use of Wood, II. 83; Leaves of, II. 84; Catkins of, II. 87

### B

Babington, Professor, on the Willow, I. 91  
 Barrington, Hon. Daines, on the Box, II. 132  
 Barry Cornwall on the Stone Pine, II. 119.  
 Bay-leaved Willow, I. 93  
 Bedford Willow, I. 91, 93  
 Beech, The, I. 41; distribution of, I. 42; Bark of, I. 42; size of, I. 44; Leaves of, I. 44; Flowers of, I. 45; uses of, I. 47; largest Trees, I. 48; Nuts or Mast of, I. 48  
 Bergamot Pear, II. 147  
 Birch, The, II. 1; distribution of, II. 2; Catkins of, II. 2; Leaves of, II. 4; uses of, II. 5; growth of, II. 8  
 Birch Family, II. 1, 65.  
 Bird Cherry, I. 9, 11; II. 19  
 Black Poplar, I. 59, 60  
 Blackthorn, The, II. 123  
 Blue Willow, I. 94  
 Bog Oak, I. 7  
 Box, The, II. 129; range of, II. 130; Leaves of, II. 131; Flowers of, II. 131; Seeds of, II. 132; uses of, II. 136

Boxwood, II. 136  
 Brande on the Hawthorn, I. 149  
 Browne, Sir Thomas, on the Yew,  
 II. 61; on the Alder, II. 70  
 Browning, Mrs., on the Linden, I.  
 53  
 Bryant on the Plane, I. 18  
 Buck-Eye Family, I. 105  
 Bullace, The, II. 123  
 Burgundy Pitch, II. 79  
 Button-ball or Buttonwood, I. 20

## C

Campbell on the Beech, I. 46  
 Canoe or Paper Birch, II. 2  
 Canterbury Elm, The, II. 142  
 Catkins, Alder, II. 70; Aspen, II. 87;  
 Birch, II. 2; Cedar of Lebanon,  
 II. 45; Chestnut, I. 138; Scotch  
 Fir, I. 76; Hazel, II. 50; Hornbeam,  
 I. 124; Larch, I. 115; Oak, I. 5;  
 Plane, I. 20; Poplar, I. 53; Spruce  
 Fir, II. 77; Stone Pine, II. 115;  
 Walnut, II. 100; Weeping Willow,  
 I. 66; Willow, I. 92.  
 Cedar of Lebanon, The, II. 41; origin  
 of name, II. 41; characters of, II.  
 42; Biblical allusions to, II. 43;  
 Bark of, II. 43; growth of, II.  
 44; Catkins of, II. 45; Cones of,  
 II. 45; Legends of, II. 46; intro-  
 duction of, II. 46; oldest Tree,  
 II. 46; largest Trees, II. 48  
 Chaucer on the Linden, I. 52; on the  
 Laurel, II. 18  
 Cherry, The, I. 9; range of, I. 10;  
 distinctive features of, I. 10; in-  
 troduction of, I. 12; largest Trees,  
 I. 15  
 Cherry, Bird, I. 9, 11  
 Cherry, Dwarf, I. 9, 12

Cherry Laurel, II. 19  
 Cherry, Wild, or Gean, I. 9, 11  
 Chestnut, Sweet, or Spanish, I. 33;  
 history of, I. 34; size of, I. 35;  
 Bark of, I. 36; Foliage of, I. 37;  
 Catkins of, I. 38; Fruit of, I. 39;  
 Timber of, I. 39  
 Chichester Elm, The, II. 142  
 Clare on the Apple, I. 29  
 Cluster Pine, II. 115  
 Cobbett, William, on the Acacia,  
 II. 10  
 Common or Cherry Laurel. *See*  
 Laurel.  
 Common Elm, The. *See* Elm.  
 Common Maple, II. 36  
 Common Osier, I. 95  
 Copper Beech, I. 47  
 Cork Elm, II. 141  
 Cork Oak, I. 97  
 Cornel, II. 107  
 Corsican Pine, II. 116  
 Cornwall, Barry, on the Stone Pine,  
 II. 119  
 Cowley on the Walnut, II. 93, 103  
 Cowper on the Willow, I. 72; on the  
 Sycamore, I. 158  
 Crab-Apple, I. 27  
 Crack Willows, I. 67, 91, 93  
 Cypress, The, II. 153; size of, II.  
 154; large Trees, II. 154; largest  
 Tree, II. 155; Flowers of, II. 155;  
 Wood of, II. 156; growth of, II.  
 159

## D

Damson or Bullace, II. 123.  
 Danewort, or Dwarf Elder, I. 143  
 Darwin on the Apple, I. 26; on Pines,  
 I. 78; on the Holly, I. 134  
 De Candolle on the Yew, II. 59; on  
 the Box, II. 134

Decaisne, Professor, on the Pear,  
II. 147  
Deodar, The, II. 42  
Dogwood, II. 107  
Downton Elm, The, II. 141  
Dryden on the Box, II. 135  
Durmast Oak, I. 4  
Dutch Elm, The, II. 142  
Dwarf Cherry, I. 9, 12  
Dwarf Elder or Danewort, I. 143  
Dyer on the Elder, I. 142

## E

Elder, The, I. 137; Berries of, I.  
139; size of, I. 139; Flowers of,  
I. 141  
Ellacombe, The Rev. H. N., on the  
Hazel, II. 50  
Elm, The Common, II. 25; Flowers  
of, II. 26; distinctive characters  
of, II. 27; size of, II. 27; Leaves  
of, II. 27; range of, II. 28; In-  
sect foes of, II. 29; Timber of,  
II. 30  
Elm-bark Beetle, II. 29  
Elm Family, II. 25, 137.  
English Oak, I. 3  
Essex Elm, The, II. 143  
Evelyn on the Hornbeam, I. 127; on  
the Holly, I. 135; on the Acaecia,  
II. 10; on the Laurel, II. 22; on  
the Hazel, II. 52; on the Ash, II.  
91, 94; on the Walnut, II. 99; on  
the Cypress, II. 157  
Evergreen Oak. *See* Holm, The  
Exeter Elm, The, II. 141

## F

False Acaecia, The, II. 12  
Fig Mulberry, or True Sycamore,  
I. 154

Filbert, The, II. 53  
Fir Family, I. 73, 113; II. 41, 73, 113,  
153  
Fir, The Scotch, I. 73; distribution  
of, I. 74; size of, I. 74; Leaves of,  
I. 75; Flowers of, I. 76; Catkins of,  
I. 76; Cones of, I. 76; Seeds of,  
I. 77; Timber of, I. 78; Torehes  
of, I. 79; Insects on, I. 79  
Fir, The Spruce. *See* Spruce Fir.  
Fir-weevil, I. 79  
Flowering Ash, II. 93  
French Willow, I. 94

## G

Galls, Oak, I. 7  
Gaten, or Gaitre Tree, II. 107  
Gatteridge, II. 107  
Gean, The, I. 9, 11  
Gerard, John, on the Plane, I. 19;  
on the Apple, I. 31; on the Horn-  
beam, I. 126; on the Sycamore,  
I. 155; on the Laurel, II. 21; on  
the Yew, II. 63; on the Plum,  
II. 124; on the Box, II. 133  
Gilpin, William, on the Rowan, I. 83;  
on the Alder, II. 66; on the Ash,  
II. 89, 92; on the Stone<sup>3</sup> Pine, II.  
117; on the Wych Elm, II. 139;  
on the Wild Pear, II. 152; on the  
Cypress, II. 154  
Glastonbury Thorn, I. 147  
Goat-Moth, II. 29  
Goat Willow, I. 95  
Golden Willow, I. 94  
Goldsmith on the Hawthorn, I. 151  
Gower on the Hazel, II. 53  
Great Maple, I. 153  
Green, or Live Oak, I. 97  
Grey Poplar, I. 59, 60  
Guelder Rose, I. 86, 88, 137

## H

- Hartlib, Samuel, on the Apple, I. 32
- Hawthorn, The, I. 145; range of, I. 145; Fruit of, I. 146; Bark of, I. 146; pastoral charm of, I. 148; Blossom of, I. 149
- Hazel, The, II. 49; Flowers of, II. 49; Catkins of, II. 50; Nuts of, II. 50; Leaves of, II. 51; range of, II. 52; uses of, II. 53; Wood of, II. 55; Fruit of, II. 55
- Hazel Family, I. 121, II. 49.
- Hellenic Pear II. 147
- Hemans, Mrs., on the Aspen, II. 86
- Henslow, Professor, on the Elder, I. 139
- Hodgen's Holly, I. 136
- Holly, The, I. 129; distribution of, I. 132; size of, I. 133; Foliage of, I. 133; Flowers of, I. 134; Berry of, I. 135
- Holly Family, The, I. 129
- Holm, The, or Evergreen Oak, I. 97; distribution of, I. 98; size of, I. 98; age of, I. 99; Leaves of, I. 100; Flowers of, I. 100; Acorns of, I. 101; growth of, I. 101; Bark of, I. 102; Timber of, I. 102
- Holmes, Oliver Wendell, on the Oak, I. 2
- Honeysuckle Family, I. 137
- Hood on the Fir, I. 75
- Hornbeam, The, I. 121; distribution of, I. 121; size of, I. 123; Bark of, I. 124; Leaves of, I. 124; Catkins of, I. 124; Wood of, I. 127
- Horse-Chestnut, I. 105; introduction of, I. 105; Blossom of, I. 107; Fruit of, I. 109; Leaves of, I. 109; uses of, I. 111
- Howitt, William, on the Hawthorn, I. 150

## I

- Indian Pear, II. 147
- Intermediate Linden, The, I. 51

## J

- Japanese Spindle-Tree, II. 111
- Jefferies on the Elm, II. 29

## K

- Kermes Oak, I. 97
- Koch, Professor Karl, on the Pear II. 147

## L

- Lamartine on the Cedar of Lebanon, II. 45
- Larch, The, I. 113; introduction of, I. 113; distribution of, I. 114; Catkins of, I. 115; size of, I. 116; distribution of, I. 116; Timber of, I. 117; Bark of, I. 117; uses of, I. 117; Turpentine, I. 118; growth of, I. 118
- Large-leaved Linden, The, I. 52
- Lauder, Sir Thomas Dick, on the Sycamore, I. 155, 159; on the Alder, II. 67; on the Wych Elm, II. 140
- Laurel, Common, or Cherry, II. 17; Leaves of, II. 19; growth of, II. 20; introduction of, II. 20; Bark of, II. 21; poison, II. 23; largest, II. 24
- Laurustinus, I. 138
- Lebanon Cedar, The, II. 42
- Lees, Dr. Edwin, on the Beech, I. 46



Leigh Hunt on the Stone Pine, II. 120  
Lime. *See* Linden

Linden Family, I. 49

Linden, or Lime, I. 49; distribution of, I. 49; size of, I. 51; forms of, I. 51; Leaves of, I. 52; Blossom, I. 53; Large Trees, I. 54; uses of, I. 54

Lombardy Poplar, The, I. 57; Catkins of, I. 58; species of, I. 59; distribution of, I. 61; Timber of, I. 64

Love-in-a-Mist, II. 110

## M

Maple, The, II. 33; range of, II. 34; size of, II. 35; Leaves of, II. 36; distinctive features of, II. 36; Fruit of, II. 37; uses of Wood of, II. 38; propagation of, II. 39; black fungus on, II. 40

Maple Family, I. 153

Maple, The Great, I. 153

Maple-leaved Plane, I. 23

Martyn, Professor Thomas, on the Syeamore, I. 155

Mandeville, Sir John, on the White-thorn, I. 148

May, I. 147

Miller on the Lareh, I. 113; on the Laurel, II. 22

Milton on the Pine, I. 79

Mistletoe on the Apple, I. 27

Mongolie Pear, II. 147

Mount Atlas Cedar, II. 42

Mountain Ash. *See* Rowan

## N

Newton, Thomas, on the Willow, I. 68

Nuts, Beech, I. 48; Hazel, II. 50;

Horse Chestnut, I. 109; Sweet, or Spanish Chestnut, I. 89; Walnut II. 101.

## O

Oak, The, I. 1; range of, I. 3; size of, I. 4; foliage of, I. 5; Catkins of, I. 5; Aeorns of, I. 6; Timber of, I. 7; Bark of, I. 7; parasites of, I. 7

Oak-apple, I. 7

Oak, Artiechoke gall on the, I. 7

Oak, Bog, I. 7

Oak, Durmast, I. 4

Oak, English, I. 3

Oak, Evergreen, I. 3

Oak Family, The, I. 1, 33, 41, 97

Oak-galls, I. 7

Oak-leaf-roller Moth, I. 7

Oak Spangles, I. 7

Oak, The Cowthorpe, I. 8

Oak, The Great Newland, I. 8

Oak, "The Tree of Freedom" (Fitzgerald), I. 1.

Oak, Turkey, I. 3

Oak, White, I. 4

Occidental, or American, Plane, I. 21

Oleaster-leaved Pear, II. 147

Olive Family, II. 89.

Oriental Plane, I. 17

Ovid on the Beech, I. 46

## P

Parkinson, John, on the Apple, I. 31; on the Syeamore, I. 155; on the Acaecia, II. 9; on the Laurel, II. 20; on the Box, II. 133

Pear, The, II. 145; Blossoms of, II. 146, 150; introduction of, II. 146; distribution of, II. 146; Fruit of II. 151

Pea and Bean Family, II. 9.  
 Pine-chafer, I. 79  
 Pine-cone or Fir-apple, I. 77  
 Pine-sawfly, I. 79  
 Pine, The Stone. *See* Stone Pine  
 Pitch Pine, II. 116  
 Plane, The, I. 17; Catkins of, I. 20;  
     Timber of, I. 20; distribution of,  
     I. 20; large, I. 22; distinctive  
     character of, I. 23  
 Plane Family, I. 17  
 Plane, Maple-leaved, I. 23  
 Pliny on the Plane, I. 22; on the  
     Linden, I. 50; on the Walnut, II.  
     98; on the Pear, II. 148; on the  
     Cypress, II. 157  
 Plum, The, II. 121; distinctive cha-  
     racter of, II. 123; range of, II.  
     124; Fruit of, II. 127  
 Pontic Pear, II. 147  
 Popering Pear, II. 148  
 Poplar, Abele or White, I. 59; Aspen,  
     II. 59; Black, I. 59; Grey, I. 59, 60;  
     Lombardy, I. 57  
 Portugal Laurel, II. 19  
 Prickwood, II. 107  
 Prior, Dr., on the Beech, I. 42; on  
     the Yew, II. 57  
 Purple Osier, I. 95

## Q

Quickset, I. 147  
 Quaterrmain, Allan, on Trees, II. 144

## R

Ray, on the Apple, I. 31; on the Sycamore, I. 155; on the Acacia, II. 10; on the Laurel, II. 22; on the Box, II. 134

Red Osier, I. 95  
 Resin, II. 79  
 Robinia or False Acacia, II. 11  
 Rose Family, I. 9, 25, 81, 145; II. 17, 121, 145  
 Rose Willow, I. 95  
 Rowan, The, or Mountain Ash, I. 81;  
     distinctive features of, I. 81;  
     Fruit of, I. 82; Bark of, I. 83;  
     size of, I. 84; Foliage of, I. 85;  
     growth of, I. 87  
 Ruskin on Trees, I. 15; on Pines, I. 80; on the Aspen, II. 85

## S

Saekville on the Hawthorn, I. 148  
 Sallow, The, I. 95  
 Sandy or Snow Pear, II. 147  
 Scotch Elm, The, II. 143  
 Scotch Fir, The. *See* Fir  
 Scotch Pine or Fir. *See* Fir  
 Scots Pine, The, II. 116  
 Scott on the Aspen, II. 86  
 Selby on the Cherry, I. 14; on the  
     Sycamore, I. 159  
 Service Trees, I. 81  
 Shakespeare on the Oak, I. 2; the  
     Cherry, I. 13; the Apple, I. 31;  
     the Chestnut, I. 36; the Willow,  
     I. 69; the Pine, I. 75; the Holly,  
     I. 133; the Elder, I. 138; the  
     Birch, II. 7; the Yew, II. 61, 62;  
     the Plum, II. 124  
 Silver Birch, I. 88  
 Silver Firs, I. 74  
 Sloe, The, II. 123  
 Small-leaved Linden, I. 51  
 Smith, Sir J. E., on the Hornbeam,  
     II. 22  
 Southey on the Holly, I. 134; on the  
     Cedar of Lebanon, II. 45

Spangles, Oak, I. 7  
 Spanish Holly-leaved Oak, I. 101  
 Spenceer on the Plane, I. 18; on the Willow, I. 69; on the Elder, I. 138; on the Hawthorn, I. 150; on the Yew, II. 62; on the Aspen, II. 84; on the Ash, II. 89  
 Spindle-Tree, The, II. 105; size of, II. 105; distinctive characters of, II. 106; range of, II. 106; large Trees, II. 108; formation of Cork, II. 108; Leaves of, II. 109; Seeds of, II. 110; Wood of, II. 111; uses of, II. 111  
 Spindle-Tree Family, II. 105  
 Spruce Fir, The, II. 73; size of, II. 75; Bark of, II. 76; Leaves of, II. 76; Catkins of, II. 77; Cones of, II. 77; growth of, II. 77; distribution of, II. 78; Wood of, II. 78; Resin, II. 79; uses of the Bark, II. 79  
 Spruces, I. 74  
 Spurge Family, II. 129  
 Stone Pine, The, II. 113; Leaves of, II. 114; Catkin of, II. 115; Pollen of, II. 115; range of, II. 116; Cones of, II. 117; size of, II. 119; Seeds of, II. 119  
 Sweet Chestnut. *See* Chestnut  
 Syeamore, The, I. 153; distribution of, I. 154; size of, I. 155; Foliage of, I. 156; Flowers of, I. 157; parasite fungus on, I. 157; Wood of, I. 158; uses of, I. 158

## T

Tall Poplars, I. 58  
 Tennyson on the Laburnum, I. 13; on the Plane, I. 22; on the Ash, II. 93; on the Spindle-Tree, II. 112

Thomson on the Aspen, II. 86  
 Thorn, The, I. 147  
 Trees, Ruskin on, I. 15  
 Turkey Oak, I. 3  
 Turner, Robert, on the Yew, II. 63  
 Turner, William, on the Plane, I. 19; on the Chestnut, I. 36; on the Lombardy Poplar, I. 61; on the Holly, I. 131; on the Syeamore, I. 155; on the Bireh, II. 2, 6; on the Yew, II. 62; on the Spruce Fir, II. 75; on the Spindle-Tree, II. 107; on the Plum, II. 124; on the Box, II. 133; on the Wyeh Elm, II. 138; on the Cypress, II. 145

## V

Virgil on the Linden, I. 50; on Hazel twigs, II. 53; on the Alder, II. 67

## W

Walnut, The, II. 97; introduction of, II. 97; size of, II. 99; uses of, II. 99; Bark of, II. 100; Miraculous Tree, II. 100; Leaves of, II. 100; Catkins of, II. 100; Flowers of, II. 101; Fruit of, II. 101  
 Walnut Family, II. 97  
 Warden, or Lukeward's Pear, II. 148  
 Weeping Willow, The, I. 65; introduction of, I. 66; Catkins of, I. 66; distribution of, I. 66; Torehes of, I. 70; introduction of, I. 71; Flowers of, I. 171; uses of, I. 71  
 Weevil, The, II. 56  
 Weymouth Pine, II. 116  
 White Acacia, II. 11

White Beam, I. 81  
 White, Gilbert, on the Yew, II. 63  
 White Oak, I. 4  
 White Poplar, I. 59, 60  
 White or Silver Birch, II. 2  
 Whitethorn, I. 86, 147  
 White Willow, The, I. 67, 91, 93  
 Wild Bergamot Pear, II. 147  
 Wild Cherry, I. 9, 11.  
 Wild Plum, II. 123  
 Wild Service, I. 81  
 Willow, The, I. 89; uses of, I. 89;  
     Bark of, I. 89; distribution of,  
     I. 90; distinctive features of, I. 92;  
     Catkins of, I. 92  
 Willow Family, The, I. 57, 65, 69; II. 81  
 Witch Knots or Witches' Brooms,  
     II. 7  
 Wordsworth on the Pine, I. 80; on  
     the Mountain Ash, I. 86; on the  
     Larch, I. 119

Wyeh Elm, The, II. 137; introduc-  
     tion of, II. 137; size of, II. 139;  
     growth of, II. 140; fine specimens  
     of, II. 143

Wyeh Hazel, II. 138

# Y

Yew, The, II. 57; origin of name,  
     II. 57; in churchyards, II. 58;  
     Wood of, II. 59; age of, II.  
     59; its connection with religion,  
     II. 60; at funerals, II. 61;  
     large Trees, II. 62; use of for  
     Bows, II. 62; Seeds of, II. 63;  
     poison of, II. 63; shape of Trees,  
     II. 64

Yew Family, II. 57

Yoke-Elm, I. 127







A SELECTED LIST

OF

CASSELL & COMPANY'S

PUBLICATIONS.



## Illustrated, Fine Art, and other Volumes.

- Abbeys and Churches of England and Wales, The: Descriptive, Historical, Pictorial.** Series II. 21s.
- A Blot of Ink.** Translated by Q and PAUL FRANCKE. 5s.
- A Book of Absurdities.** By an Old Volunteer. 2s. 6d.
- Adventure, The World of.** Fully Illustrated. Complete in Three Vols. 9s. each.
- Africa and its Explorers, The Story of.** By Dr. ROBERT BROWN, F.R.G.S., &c. With about 800 Original Illustrations. Complete in 4 Vols. 7s. 6d. each.
- Agrarian Tenures.** By the Rt. Hon. G. SHAW LEFEVRE, M.P. 10s. 6d.
- Allon, Henry, D.D.: Pastor and Teacher.** The Story of his Ministry, with Selected Sermons and Addresses. By the Rev. W. HARDY HARWOOD. 6s.
- American Life.** By PAUL DE ROUSIERS. 12s. 6d.
- Animal Painting in Water Colours.** With Coloured Plates. 5s.
- Arabian Nights Entertainments (Cassell's).** With about 400 Illustrations. 10s. 6d.
- Architectural Drawing.** By R. PHÉNÉ SPIERS. Illustrated. 10s. 6d.
- Art, The Magazine of.** Yearly Volume. With about 400 Illustrations, 14 Etchings or Photogravures, and a Series of Full-page Plates. 21s.
- Artistic Anatomy.** By Prof. M. DUVAL. *Cheap Edition*. 3s. 6d.
- Astronomy, The Dawn of.** A Study of the Temple Worship and Mythology of the Ancient Egyptians. By Professor J. NORMAN LOCKYER, C.B., F.R.S., &c. Illustrated. 21s.
- Atlas, The Universal.** A New and Complete General Atlas of the World, with 117 Pages of Maps, handsomely produced in Colours, and a Complete Index to about 125,000 Names. Complete in One Vol., cloth, gilt edges, 36s. net; or half-morocco, gilt edges, 42s. net.
- Avenger of Blood, The.** By J. MACLAREN COBBAN. 3s. 6d.
- Awkward Squads, The; and other Ulster Stories.** By SHAN F. BULLOCK. 5s.
- Baby, A White.** By a New Writer. Being the Second Volume of "Cassell's Pocket Library." 1s. 4d.
- Bashkirtseff, Marie, The Journal of.** Translated by MATHILDE BLIND. 7s. 6d.
- Bashkirtseff, Marie, The Letters of.** Translated by MARY J. SERRANO. 7s. 6d.
- Beetles, Butterflies, Moths, and other Insects.** By A. W. KAPPEL, F.L.S., F.E.S., and W. EGMONT KIRBY. With 12 Coloured Plates. 3s. 6d.
- Biographical Dictionary, Cassell's New.** Containing Memoirs of the Most Eminent Men and Women of all Ages and Countries. 7s. 6d.
- Birds' Nests, Eggs, and Egg-Collecting.** By R. KEARTON. Illustrated with 16 Coloured Plates of Eggs. 5s.
- Breechloader, The, and How to Use It.** By W. W. GREENER. *New and Enlarged Edition*. 2s. 6d.
- British Ballads.** 275 Original Illustrations. Two Vols. Cloth, 15s.
- British Battles on Land and Sea.** By JAMES GRANT. With about 600 Illustrations. Four Vols. 4to, £1 16s.; *Library Edition*, Four Vols., £2.
- Browning, An Introduction to the Study of.** By ARTHUR SYMONS. 2s. 6d.
- Butterflies and Moths, European.** By W. F. KIRBY. With 61 Coloured Plates, 35s.
- Campaigns of Curiosity.** By ELIZABETH L. BANKS. Illustrated. 2s.
- Canaries and Cage-Birds, The Illustrated Book of.** By W. A. BLAKSTON, W. SWAYSLAND, and A. F. WIENER. With 56 Fac-simile Coloured Plates. 35s.
- Capture of the "Estrella," The.** A Tale of the Slave Trade. By COMMANDER CLAUD HARDING, R.N. 5s.
- Carnation Manual, The.** Edited and Issued by the National Carnation and Picotee Society (Southern Section). 3s. 6d.
- Cassell, John.** By G. HOLDEN PIKE. With Portrait. 1s.
- Cassell's Family Magazine.** Yearly Volume. Illustrated. 9s.
- Cathedrals, Abbeys, and Churches of England and Wales.** Descriptive, Historical, Pictorial. *Popular Edition*. Two Vols. 25s.
- Catriona.** A Sequel to "Kidnapped." By ROBERT LOUIS STEVENSON. 6s.
- Cats and Kittens.** By HENRIETTE RONNER. With Portrait and 13 magnificent Full-page Photogravure Plates and numerous Illustrations. 4to, £2 10s.
- Cavour, Count, and Madame de Circourt.** Translated by A. J. BUTLER. 10s. 6d.
- China Painting.** By FLORENCE LEWIS. With Sixteen Coloured Plates, &c. 5s.
- Choice Dishes at Small Cost.** By A. G. PAYNE. *Cheap Edition*, 1s.
- Chums.** The Illustrated Paper for Boys. Yearly Volume, 8s.
- Cities of the World.** Four Vols. Illustrated. 7s. 6d. each.

- Civil Service, Guide to Employment in the.** *Entirely New Edition.* Paper, 1s.; cloth, 1s. 6d.
- Clinical Manuals for Practitioners and Students of Medicine.** (*A List of Volumes forwarded post free on application to the Publishers.*)
- Cobden Club, Works published for the.** (*A Complete List on application.*)
- Colonist's Medical Handbook, The.** By E. ALFRED BARTON, M.R.C.S. 1s.
- Colour.** By Prof. A. H. CHURCH. *New and Enlarged Edition*, 3s. 6d.
- Columbus, The Career of.** By CHARLES ELTON, F.S.A. 10s. 6d.
- Combe, George, The Select Works of.** Issued by Authority of the Combe Trustees. *Popular Edition*, 1s. each, net.
- |   |   |
|---|---|
| The Constitution of Man.<br>Moral Philosophy. | Science and Religion.<br>Discussions on Education.<br>American Notes. |
|---|---|
- Commercial Botany of the Nineteenth Century.** By J. R. JACKSON. 2s.
- Commons and Forests, English.** By the Rt. Hon. G. SHAW-LEFEVRE, M.P. 10s. 6d.
- Conquests of the Cross.** Edited by EDWIN HODDER. With numerous Original Illustrations. Complete in Three Vols. 9s. each.
- Cookery, A Year's.** By PHYLLIS BROWNE. *New and Enlarged Edition*, 3s. 6d.
- Cookery Book, Cassell's New Universal.** By LIZZIE HERITAGE. With 12 Coloured Plates and other Illustrations. 1,344 pages, strongly bound in leather gilt, 6s.
- Cookery, Cassell's Popular.** With Four Coloured Plates. Cloth gilt, 2s.
- Cookery, Cassell's Shilling.** 110th Thousand. 1s.
- Cookery, Vegetarian.** By A. G. PAYNE. 1s. 6d.
- Cooking by Gas, The Art of.** By MARIE J. SUGG. Illustrated. Cloth, 2s.
- Cottage Gardening.** Edited by W. ROBINSON, F.L.S. Illustrated. Half-yearly Vols., II, III., and V., 2s. 6d. each. Vol. IV., 3s.
- Countries of the World, The.** By ROBERT BROWN, M.A., Ph.D., &c. Complete in Six Vols., with about 750 Illustrations. 4to, 7s. 6d. each. Cheap Edition. Vol. I., 6s.
- Cyclopædia, Cassell's Concise.** Brought down to the latest date. With about 600 Illustrations. *New and Cheap Edition*, 7s. 6d.
- Cyclopædia, Cassell's Miniature.** Containing 30,000 Subjects. Cloth, 2s. 6d.: ½ half-morocco, 4s.
- Defoe, Daniel, The Life of.** By THOMAS WRIGHT. Illustrated. 21s.
- Dick Whittington, A Modern.** By JAMES PAYN. *Cheap Edition in one Vol.*, 6s.
- Dictionaries.** (For description see alphabetical letter.) Religion, Biographical, Encyclopædic, Mechanical, English, English Literature, Domestic. (French, German, and Latin, see with *Educational Works*.)
- Diet and Cookery for Common Ailments.** By a Fellow of the Royal College of Physicians, and PHYLLIS BROWNE. 5s.
- Dog, Illustrated Book of the.** By VERO SHAW, B.A. With 28 Coloured Plates. Cloth bevelled, 35s.; half-morocco, 45s.
- Domestic Dictionary, The.** An Encyclopædia for the Household. Cloth, 7s. 6d.
- Doré Don Quixote, The.** With about 400 Illustrations by GUSTAVE DORÉ. *Cheap Edition*, bevelled boards, gilt edges, 10s. 6d.
- Doré Gallery, The.** With 250 Illustrations by GUSTAVE DORÉ. 4to, 42s.
- Doré's Dante's Inferno.** Illustrated by GUSTAVE DORÉ. *Popular Edition.* With Preface by A. J. BUTLER. Cloth gilt or buckram, 7s. 6d.
- Doré's Dante's Purgatory and Paradise.** Illustrated by GUSTAVE DORÉ. *Cheap Edition.* 7s. 6d.
- Doré's Milton's Paradise Lost.** Illustrated by GUSTAVE DORÉ. 4to, 21s. *Popular Edition.* Cloth gilt, or buckram gilt. 7s. 6d.
- Dressmaking, Modern, The Elements of.** By J. E. DAVIS. Illustrated. 2s.
- Earth, Our, and its Story.** Edited by Dr. ROBERT BROWN, F.L.S. With 36 Coloured Plates and 740 Wood Engravings. Complete in Three Vols. 9s. each.
- Edinburgh, Old and New, Cassell's.** With 600 Illustrations. Three Vols. 9s. each; library binding, £1 10s. the set.
- Egypt: Descriptive, Historical, and Picturesque.** By Prof. G. EBERS. Translated by CLARA BELL, with Notes by SAMUEL BIRCH, LL.D., &c. Two Vols. 42s.
- Electric Current, The.** How Produced and How Used. By R. MULLINEUX WALMSLEY, D.Sc., &c. Illustrated. 10s. 6d.
- Electricity, Practical.** By Prof. W. E. AYRTON. Illustrated. Cloth, 7s. 6d.
- Electricity in the Service of Man.** A Popular and Practical Treatise. With upwards of 950 Illustrations. *New and Revised Edition.* 10s. 6d.



- Employment for Boys on Leaving School, Guide to.** By W. S. BEARD, F.R.G.S. 1s. 6d.
- Encyclopædic Dictionary, The.** Complete in Fourteen Divisional Vols., 10s. 6d. each; or Seven Vols., half-morocco, 21s. each; half-russia, 25s. each.
- England, Cassell's Illustrated History of.** With upwards of 2,000 Illustrations. *New and Revised Edition.* Complete in Eight Vols., 9s. each.
- English Dictionary, Cassell's.** Containing Definitions of upwards of 100,000 Words and Phrases. *Cheap Edition*, 3s. 6d.; *Large Paper Edition*, 5s.
- English Literature, Library of.** By Prof. H. MORLEY. In 5 Vols. 7s. 6d. each.
- English Literature, Morley's First Sketch of.** *Revised Edition*, 7s. 6d.
- English Literature, The Dictionary of.** By W. DAVENPORT ADAMS. *Cheap Edition*, 7s. 6d.
- English Literature, The Story of.** By ANNA BUCKLAND. 3s. 6d.
- English Writers.** By HENRY MORLEY. Vols. I. to XI. 5s. each.
- Æsop's Fables.** Illustrated by ERNEST GRISET. *Cheap Edition.* Cloth, 3s. 6d.; bevelled boards, gilt edges, 5s.
- Etiquette of Good Society.** *New Edition.* Edited and Revised by LADY COLIN CAMPBELL. 1s.; cloth, 1s. 6d.
- Europe, Cassell's Pocket Guide to.** *Edition for 1894.* Leather, 6s.
- European Pictures of the Year.** Reproductions of Continental Pictures of 1894. Paper, 2s. 6d.; cloth, 4s.
- Fairway Island.** By HORACE HUTCHINSON. *Cheap Edition*, 3s. 6d.
- Faith Doctor, The.** A Novel. By Dr. EDWARD EGGLESTON. *Cheap Edition*, 6s.
- Family Physician.** By Eminent PHYSICIANS and SURGEONS. Cloth, 21s.; roxburgh, 25s.
- Father Mathew: His Life and Times.** By FRANK J. MATHEW. 2s. 6d.
- Fenn, G. Manville, Works by.** Boards, 2s. each; or cloth, 2s. 6d.
- |   |                                    |                                      |
|---|------------------------------------|--------------------------------------|
| <p>The Parson o' Dumford.<br/>Poverty Corner.<br/>Commodore Junk.</p> | <p>} In paper<br/>boards only.</p> | <p>My Patients. Boards or cloth.</p> |
|---|------------------------------------|--------------------------------------|
- Fiction, Cassell's Popular Library of.** 3s. 6d. each.
- |   |  |
|---|--|
| <p>The Snare of the Fowler. By Mrs. ALEXANDER.<br/>Out of the Jaws of Death. By FRANK BARRETT.<br/>Fourteen to One, &amp;c. By ELIZABETH STUART PHELPS.</p> | <p>The Medicine Lady. By L. T. MEADE.<br/>Leona. By Mrs. MOLESWORTH.<br/>Father Stafford. A Novel. By ANTHONY HOPE.<br/>Dr. Dumány's Wife. By MAURUS JÓKAI.<br/>"La Bella," and others. By EGERTON CASTLE.</p> |
|---|--|
- Field Naturalist's Handbook, The.** By Revs. J. G. WOOD and THEODORE WOOD. *Cheap Edition*, 2s. 6d.
- Figuiet's Popular Scientific Works.** With Several Hundred Illustrations in each. 3s. 6d. each.
- |  |   |  |
|--|---|--|
| <p>The Insect World.<br/>The Human Race.</p> | <p>  Reptiles and Birds.<br/>Mammalia.<br/>The World before the Deluge.</p> | <p>The Vegetable World.<br/>Ocean World.</p> |
|--|---|--|
- Figure Painting in Water Colours.** With 16 Coloured Plates. 7s. 6d.
- Flora's Feast.** A Masque of Flowers. Penned and Pictured by WALTER CRANE. With 40 pages in Colours. 5s.
- Flower Painting, Elementary.** With Eight Coloured Plates. 3s.
- Flowers, and How to Paint Them.** By MAUD NAFTEL. With Coloured Plates. 5s.
- Football: the Rugby Union Game.** Edited by Rev. F. MARSHALL. Illustrated. *New and Enlarged Edition.* 7s. 6d.
- Fossil Reptiles, A History of British.** By Sir RICHARD OWEN, F.R.S., &c. With 268 Plates. In Four Vols. £12 12s.
- Franco-German War, Cassell's History of the.** Complete in Two Vols., containing about 500 Illustrations. 9s. each.
- Fraser, John Drummond.** By PHILAETHES. A Story of Jesuit Intrigue in the Church of England. *Cheap Edition.* 1s. 6d.
- Free Lance in a Far Land, A.** By HERBERT COMPTON. 6s.
- Garden Flowers, Familiar.** By SHIRLEY HIBBERD. With Coloured Plates by F. E. HULME, F.L.S. Complete in Five Series. Cloth gilt, 12s. 6d. each.
- Gardening, Cassell's Popular.** Illustrated. Complete in Four Vols. 5s. each.
- Gazetteer of Great Britain and Ireland, Cassell's.** With numerous Illustrations and Maps in Colours. Vols. I. and II. 7s. 6d.
- Geometrical Drawing for Army Candidates.** By H. T. LILLEY, M.A. 2s. 6d.
- Geometry, First Elements of Experimental.** By PAUL BERT. 1s. 6d.
- George Saxon, The Reputation of.** By MORLEY ROBERTS. 5s.



- Gilbert, Elizabeth, and her Work for the Blind. By FRANCES MARTIN. 2s. 6d.  
Gladstone, The Right Hon. W. E., M.P., Life of. Profusely Illustrated. 1s.  
Gleanings from Popular Authors. Two Vols. With Original Illustrations.  
9s. each. Two Vols. in One, 15s.  
Gulliver's Travels. With 88 Engravings. Cloth, 3s. 6d. ; cloth gilt, 5s.  
Gun and its Development, The. By W. W. GREENER. Illustrated. 10s. 6d.  
Guns, Modern Shot. By W. W. GREENER. Illustrated. 5s.  
Health, The Book of. By Eminent Physicians and Surgeons. Cloth, 21s.  
Health Laws, The London. Prepared by the Mansion House Council on the  
Dwellings of the Poor. Limp cloth, 2s.  
Heavens, The Story of the. By Sir ROBERT STAWELL BALL, LL.D., F.R.S.  
With Coloured Plates and Wood Engravings. *Popular Edition*, 12s. 6d.  
Heroes of Britain in Peace and War. With 300 Original Illustrations. *Cheap  
Edition*. Two Vols. 3s. 6d. each ; or two vols. in one, cloth gilt, 7s. 6d.  
Hiram Golf's Religion ; or, the Shoemaker by the Grace of God. 2s.  
Hispaniola Plate (1683-1893). By JOHN BLOUNDELLE-BURTON. 6s.  
Historic Houses of the United Kingdom. With Contributions by the Rev. Pro-  
fessor BONNEY, F.R.S., and others. Profusely Illustrated. 10s. 6d.  
History, A Footnote to. Eight Years of Trouble in Samoa. By R. L. STEVENSON. 6s.  
Home Life of the Ancient Greeks, The. Translated by ALICE ZIMMERN.  
Illustrated. 7s. 6d.  
Horn, Captain, The Adventures of. By FRANK STOCKTON. 6s.  
Horse, The Book of the. By SAMUEL SIDNEY. With 17 Full-page Collotype  
Plates of Celebrated Horses of the Day, and numerous other Illustrations. Cloth, 15s.  
Houghton, Lord : The Life, Letters, and Friendships of Richard Monckton  
Milnes, First Lord Houghton. By Sir WEMYSS REID. Two Vols. 32s.  
Household, Cassell's Book of the. Illustrated. Complete in Four Vols. 5s. each ;  
or Four Vols. in two, half-morocco, 25s.  
Hygiene and Public Health. By B. ARTHUR WHITELEGGE, M.D. Illustrated.  
*New and Revised Edition*. 7s. 6d.  
Impregnable City, The. By MAX PEMBERTON. 6s.  
India, Cassell's History of. By JAMES GRANT. With 400 Illustrations. Two  
Vols., 9s. each, or One Vol., 15s.  
In-door Amusements, Card Games, and Fireside Fun, Cassell's Book of.  
With numerous Illustrations. *Cheap Edition*. Cloth, 2s.  
Iron Pirate, The. By MAX PEMBERTON. Illustrated. 5s.  
Island Nights' Entertainments. By R. L. STEVENSON. Illustrated, 6s.  
Italy from the Fall of Napoleon I. in 1815 to 1890. By J. W. PROBYN. 3s. 6d.  
Kennel Guide, Practical. By Dr. GORDON STABLES. Illustrated. *Cheap Edition*, 1s.  
Khiva, A Ride to. Travels and Adventures in Central Asia. By Col. FRED  
BURNABY. *New Edition*. With Portrait and Seven Illustrations. 3s. 6d.  
King's Diary, A. By PERCY WHITE. Cloth, 1s. 4d.  
King's Hussar, A. Memoirs of a Troop Sergeant-Major of the 14th (King's)  
Hussars. Edited by HERBERT COMPTON. 6s.  
Ladies' Physician, The. By a London Physician. 6s.  
Lady's Dressing Room, The. Translated from the French by LADY COLIN  
CAMPBELL. 3s. 6d.  
Lady Biddy Fane, The Admirable. By FRANK BARRETT. *New Edition*.  
With 12 Full-page Illustrations. 6s.  
Lake Dwellings of Europe. By ROBERT MUNRO, M.D., M.A. Cloth, 31s. 6d.  
Letters, The Highway of ; and its Echoes of Famous Footsteps. By THOMAS  
ARCHER. Illustrated, 10s. 6d.  
Letts's Diaries and other Time-saving Publications are now published exclu-  
sively by CASSELL & COMPANY. (*A List sent post free on application.*)  
Liquor Traffic, Popular Control of the. By Dr. E. R. L. GOULD. With an Intro-  
duction by the Rt. Hon. J. CHAMBERLAIN, M.P. 1s.  
'Lisbeth. A Novel. By LESLIE KEITH. *Cheap Edition*. One Vol. 6s.  
List, ye Landsmen ! A Romance of Incident. By W. CLARK RUSSELL. 6s.  
Little Minister, The. By J. M. BARRIE. *Illustrated Edition*, 6s.  
Little Squire, The. A Story of Three. By Mrs. HENRY DE LA PASTURE. 3s. 6d.  
Lobengula, Three Years with, and Experiences in South Africa. By J.  
COOPER-CHADWICK. *Cheap Edition*. 2s. 6d.  
Locomotive Engine, The Biography of a. By HENRY FRITH. 3s. 6d.  
Loftus, Lord Augustus, P.C., G.C.B., The Diplomatic Reminiscences of. First  
Series. With Portrait. Two Vols. 32s. Second Series. Two Vols. 32s.  
London, Greater. By EDWARD WALFORD. Two Vols. With about 400  
Illustrations. 9s. each. *Library Edition*. Two Vols. £1 the set.

- London, Old and New.** By WALTER THORNBURY and EDWARD WALFORD. Six Vols., with about 1,200 Illustrations. Cloth, 9s. each. *Library Edition*, £3.
- Lost on Du Corrig; or, 'Twixt Earth and Ocean.** By STANDISH O'GRADY. With 8 Full-page Illustrations. 5s.
- Man in Black, The.** By STANLEY WEYMAN. With 12 full-page Illustrations. 3s. 6d.
- Medical Handbook of Life Assurance.** By JAMES EDWARD POLLOCK, M.D., and JAMES CHISHOLM. *New and Revised Edition.* 7s. 6d.
- Medicine, Manuals for Students of.** (*A List forwarded post free on application.*)
- Modern Europe, A History of.** By C. A. FYFFE, M.A. Complete in Three Vols., with full-page Illustrations. 7s. 6d. each.
- Mount Desolation.** An Australian Romance. By W. CARLTON DAWE. 3s. 6d.
- Music, Illustrated History of.** By EMIL NAUMANN. Edited by the Rev. Sir F. A. GORE OUSELEY, Bart. Illustrated. Two Vols. 31s. 6d.
- National Library, Cassell's.** Consisting of 214 Volumes. Paper covers, 3d.; cloth, 6d. (*A Complete List of the Volumes post free on application.*)
- Natural History, Cassell's Concise.** By E. PERCEVAL WRIGHT, M.A., M.D., F.L.S. With several Hundred Illustrations. 7s. 6d.; also kept half-bound.
- Natural History, Cassell's New.** Edited by P. MARTIN DUNCAN, M.B., F.R.S., F.G.S. Complete in Six Vols. With about 2,000 Illustrations. Cloth, 9s. each.
- Nature's Wonder Workers.** By KATE R. LOVELL. Illustrated. 3s. 6d.
- Nelson, The Life of.** By ROBERT SOUTHEY. Illustrated with Eight Plates. 3s. 6d.
- New England Boyhood, A.** By EDWARD E. HALE. 3s. 6d.
- Nursing for the Home and for the Hospital, A Handbook of.** By CATHERINE J. WOOD. *Cheap Edition*, 1s. 6d.; cloth, 2s.
- Nursing of Sick Children, A Handbook for the.** By CATHERINE J. WOOD. 2s. 6d.
- O'Driscoll's Weird, and Other Stories.** By A. WERNER. Cloth, 5s.
- Old Dorset.** Chapters in the History of the County. By H. J. MOULE, M.A. 10s. 6d.
- Our Own Country.** Six Vols. With 1,200 Illustrations. Cloth, 7s. 6d. each.
- Painting, The English School of.** By ERNEST CHESNEAU. *Cheap Edition*, 3s. 6d.
- Paris, Old and New.** Profusely Illustrated. Complete in Two Volumes. 9s. each, or gilt edges, 10s. 6d. each.
- Peoples of the World, The.** By Dr. ROBERT BROWN. Complete in Six Vols. With Illustrations. 7s. 6d. each.
- Perfect Gentleman, The.** By the Rev. A. SMYTHE-PALMER, D.D. 2s.
- Photography for Amateurs.** By T. C. HEPWORTH. Illustrated, 1s.; cloth, 1s. 6d.
- Physiology for Students, Elementary.** By ALFRED T. SCHOFIELD, M.D., M.R.C.S. With Two Coloured Plates and numerous Illustrations. *New Edition.* 5s.
- Picturesque America.** Complete in Four Vols., with 48 Exquisite Steel Plates, and about 800 Original Wood Engravings. £2 2s. each. *Popular Edition*, Vols. I. and II., price 18s. each.
- Picturesque Canada.** With about 600 Original Illustrations. Two Vols. £6 6s. the set.
- Picturesque Europe.** Complete in Five Vols. Each containing 13 Exquisite Steel Plates, from Original Drawings, and nearly 200 Original Illustrations. £21; half-morocco, £31 10s.; morocco gilt, £52 10s. *Popular Edition.* In Five Vols. 18s. each.
- Picturesque Mediterranean, The.** With a Series of Magnificent Illustrations from Original Designs by leading Artists of the day. Two Vols. Cloth, £2 2s. each.
- Pigeon Keeper, The Practical.** By LEWIS WRIGHT. Illustrated. 3s. 6d.
- Pigeons, Fulton's Book of.** Edited by LEWIS WRIGHT. Revised, Enlarged and supplemented by the Rev. W. F. LUMLEY. With 50 Full-page Illustrations. *Popular Edition.* In One Vol., 10s. 6d.
- Pity and of Death, The Book of.** By PIERRE LOTI. Cloth gilt, 5s.
- Planet, The Story of Our.** By the Rev. Prof. BONNEY, F.R.S., &c. With Coloured Plates and Maps and about 100 Illustrations. 31s. 6d.
- Playthings and Parodies.** Short Stories, Sketches, &c., by BARRY PAIN. 5s.
- Poetry, The Nature and Elements of.** By E. C. STEDMAN. 6s.
- Poets, Cassell's Miniature Library of the.** Price 1s. each Vol.
- Polytechnic Series, The.** Practical Illustrated Manuals. (*A List will be sent on application.*)
- Pomona's Travels.** By FRANK R. STOCKTON. Illustrated. 5s.
- Portrait Gallery, The Cabinet.** Complete in Five Series, each containing 36 Cabinet Photographs of Eminent Men and Women of the day. With Biographical Sketches. 15s. each.
- Poultry Keeper, The Practical.** By LEWIS WRIGHT. Illustrated. 3s. 6d.
- Poultry, The Book of.** By LEWIS WRIGHT. *Popular Edition.* Illustrated. 10s. 6d.
- Poultry, The Illustrated Book of.** By LEWIS WRIGHT. With Fifty Exquisite Coloured Plates, and numerous Wood Engravings. *Revised Edition.* Cloth, 31s. 6d.



**Prison Princess, A.** By MAJOR ARTHUR GRIFFITHS. 6s.

**Q's Works, Uniform Edition of.** 5s. each.

Dead Man's Rock.  
The Splendid Spur.  
The Blue Pavilions.

The Astonishing History of Troy Town.  
"I Saw Three Ships," and other Winter's Tales.  
Noughts and Crosses.

The Delectable Duchy. Stories, Studies, and Sketches.

**Queen Summer; or, The Tourney of the Lily and the Rose.** Penned and Portrayed by WALTER CRANE. With 40 pages in Colours. 6s.

**Queen, The People's Life of their.** By Rev. E. J. HARDY, M.A. 1s.

**Queen Victoria, The Life and Times of.** By ROBERT WILSON. Complete in 2 Vols. With numerous Illustrations. 9s. each.

**Queen's Scarlet, The.** By G. MANVILLE FENN. Illustrated. 5s.

**Rabbit-Keeper, The Practical.** By CUNICULUS. Illustrated. 3s. 6d.

**Raffles Haw, The Doings of.** By A. CONAN DOYLE. *New Edition.* 3s. 6d.

**Railways, Our.** Their Origin, Development, Incident, and Romance. By JOHN PENDLETON. Illustrated. 2 Vols., demy 8vo. 24s.

**Railway Guides, Official Illustrated.** With Illustrations on nearly every page. Maps, &c. Paper covers, 1s.; cloth, 2s.

London and North Western Railway.  
Great Western Railway.  
Midland Railway.  
Great Northern Railway.

Great Eastern Railway.  
London and South Western Railway.  
London, Brighton, and South Coast Railway.  
South Eastern Railway.

**Railway Guides, Official Illustrated.** Abridged and Popular Editions. Paper covers, 3d. each.

Great Eastern Railway.  
London and North-Western Railway.

Great Western Railway.  
Midland Railway.

**Railway Library, Cassell's.** Crown 8vo, boards, 2s. each.

Metzerott, Shoemaker. By Katharine P. Woods.

David Todd. By David Maclure.

Commodore Junk. By G. Manville Fenn.

St. Cuthbert's Tower. By Florence War-  
den.

The Man with a Thumb. By W. C. Hud-  
son (Barclay North).

By Right Not Law. By R. Sherard.

Within Sound of the Weir. By Thomas  
St. E. Hake.

Under a Strange Mask. By Frank Barrett.

The Coombsberrow Mystery. By J. Colwall.

A Queer Race. By W. Westall.

Captain Trafalgar. By Westall and Laurie.

Jack Gordon, Knight Errant. By W. C.

Hudson (Barclay North).

The Diamond Button: Whose Was It?

By W. C. Hudson (Barclay North).

Who is John Noman? By C. Henry Beckett.

The Tragedy of Brinkwater. By Martha

L. Moody.

An American Penman. By Julian Haw-

thorne.

Section 558; or, The Fatal Letter. By

Julian Hawthorne.

A Tragic Mystery. By Julian Hawthorne.

The Great Bank Robbery. By Julian

Hawthorne.

**Rivers of Great Britain: Descriptive, Historical, Pictorial.**

The Royal River: The Thames from Source to Sea. *Popular Edition*, 16s.

Rivers of the East Coast. With highly-finished Engravings. *Popular Edition*, 16s.

**Robinson Crusoe.** *Cassell's New Fine-Art Edition.* With upwards of 100 Original Illustrations. 7s. 6d.

**Romance, The World of.** Illustrated. One Vol., cloth, 9s.

**Ronner, Henriette, The Painter of Cat-Life and Cat-Character.** By M. H. SPIELMANN. Containing a Series of beautiful Phototype Illustrations. 12s.

**Rovings of a Restless Boy, The.** By KATHARINE B. FOOT. Illustrated. 5s.

**Russo-Turkish War, Cassell's History of.** With about 500 Illustrations. Two Vols., 9s. each; library binding, One Vol., 15s.

**Sala, George Augustus, The Life and Adventures of.** By Himself. In Two Vols. 32s.

**Saturday Journal, Cassell's.** Illustrated throughout. Yearly Vol., 7s. 6d.

1894. By the Ven. J. M. WILSON, M.A. 1d.

**Scarabæus.** The Story of an African Beetle. By THE MARQUISE CLARA LANZA and JAMES CLARENCE HARVEY. *Cheap Edition*, 3s. 6d.

**Science for All.** Edited by Dr. ROBERT BROWN, M.A., F.L.S., &c. *Revised Edition.* With 1,500 Illustrations. Five Vols. 9s. each.

**Science Series, The Century.** Consisting of Biographies of Eminent Scientific Men of the present Century. Edited by Sir HENRY ROSCOE, D.C.L., F.R.S., M.P. Crown 8vo, 3s. 6d. each.

John Dalton and the Rise of Modern Chemistry. By Sir HENRY E. ROSCOE, F.R.S.

Major Rennell, F.R.S., and the Rise of English Geography. By R. CLEMENTS MARK-

HAM, C.B., F.R.S., President of the Royal Geographical Society.

*Other Vols. in preparation.*

**Sea Wolves, The.** By MAX PEMBERTON. Illustrated. 6s.

**Seven Ages of Man, The.** In Portfolio size. 2s. 6d. net.

**Shadow of a Song, The.** A Novel. By CECIL HARLEY. 5s.

**Shaftesbury, The Seventh Earl of, K.G., The Life and Work of.** By EDWIN HODDER. Illustrated. *Cheap Edition*, 3s. 6d.

- Shakespeare, Cassell's Quarto Edition.** Edited by CHARLES and MARY COWDEN CLARKE, and containing about 600 Illustrations by H. C. SELOUS. Complete in Three Vols., cloth gilt, £3 3s.—Also published in Three separate Vols., in cloth, viz. :—The COMEDIES, 21s. ; The HISTORICAL PLAYS, 18s. 6d. ; The TRAGEDIES, 25s.
- Shakespeare, The England of.** *New Edition.* By E. GOADBY. With Full-page Illustrations. Crown 8vo, 224 pages, 2s. 6d.
- Shakespeare, The Plays of.** Edited by Prof. HENRY MORLEY. Complete in Thirteen Vols. Cloth, in box, 21s. ; half-morocco, cloth sides, 42s.
- Shakspere, The International.** *Édition de luxe.*  
King Henry VIII. By Sir JAMES LINTON, P.R.I. (*Price on application.*)  
Othello. Illustrated by FRANK DICKSEE, R.A. £3 10s.  
King Henry IV. Illustrated by Herr EDUARD GRÜTZNER. £3 10s.  
As You Like It. Illustrated by the late Mons. ÉMILE BAYARD. £3 10s.
- Shakspere, The Leopold.** With 400 Illustrations, and an Introduction by F. J. FURNIVALL. *Cheap Edition*, 3s. 6d. Cloth gilt, gilt edges, 5s. ; roxburgh, 7s. 6d.
- Shakspere, The Royal.** With Exquisite Steel Plates and Wood Engravings. Three Vols. 15s. each.
- Sketches, The Art of Making and Using.** From the French of G. FRAIPONT. By CLARA BELL. With Fifty Illustrations. 2s. 6d.
- Smuggling Days and Smuggling Ways ; or, The Story of a Lost Art.** By Commander the Hon. HENRY N. SHORE, R.N. Illustrated. Cloth, 7s. 6d.
- Social England.** A Record of the Progress of the People. By various writers. Edited by H. D. TRAILL, D.C.L. Vols. I., II., and III., 15s. each.
- Social Welfare, Subjects of.** By LORD PLAYFAIR, K.C.B., &c. 7s. 6d.
- Sorrow, The Highway of.** By HESBA STRETTON and a well-known Russian exile. 6s.
- Sports and Pastimes, Cassell's Complete Book of.** *Cheap Edition*, 3s. 6d.
- Squire, The.** By MRS. PARR. *Cheap Edition in one Vol.*, 6s.
- Standish of High Acre, The.** A Novel. By GILBERT SHELDON. Two Vols. 21s.
- Star-Land.** By Sir ROBERT STAWELL BALL, LL.D., &c. Illustrated. 6s.
- Statesmen, Past and Future.** 6s.
- Story of Francis Cludde, The.** A Novel. By STANLEY J. WEYMAN. 6s.
- Successful Life, The.** By AN ELDER BROTHER. *Cheap Edition*, 2s.
- Sun, The Story of the.** By Sir ROBERT STAWELL BALL, LL.D., F.R.S., F.R.A.S. With Eight Coloured Plates and other Illustrations. 21s.
- Sunshine Series, Cassell's.** In Vols. 1s. each. *A List post free on application.*
- Sybil Knox ; or, Home Again.** A Story of To-day. By E. E. HALE. 6s.
- Taxation, Municipal, at Home and Abroad.** By J. J. O'MEARA. 7s. 6d.
- Tenting on the Plains.** By E. B. CUSTER. Illustrated. 5s.
- Thackeray in America, With.** By EYRE CROWE, A.R.A. Illustrated. 10s. 6d.
- Thames, The Tidal.** By GRANT ALLEN. With India Proof Impressions of 20 Magnificent Full-page Photogravure Plates, and many other Illustrations, after original drawings by W. L. WYLLIE, A.R.A. Half-morocco, gilt, gilt edges, £5 15s. 6d.
- The Short Story Library.** 5s. each. List of Vols. on application.
- They Met in Heaven.** By G. H. HEPWORTH. 2s. 6d.
- Things I have Seen and People I have Known.** By G. A. SALA. With Portrait and Autograph. 2 Vols. 21s.
- Tiny Luttrell.** By E. W. HORNING. Cloth. *Popular Edition.* 6s.
- To Punish the Czar : A Story of the Crimea.** By HORACE HUTCHINSON. Illustrated. 3s. 6d.
- "Treasure Island" Series, The.** *Cheap Illustrated Edition.* Cloth, 3s. 6d. each.  
Treasure Island. By ROBERT LOUIS STEVENSON.  
The Master of Ballantrae. By ROBERT LOUIS STEVENSON.  
The Black Arrow : A Tale of the Two Roses. By ROBERT LOUIS STEVENSON.  
King Solomon's Mines. By H. RIDER HAGGARD.
- Treatment, The Year-Book of, for 1895.** A Critical Review for Practitioners of Medicine and Surgery. Eleventh Year of Issue. 7s. 6d.
- Trees, Familiar.** By Prof. G. S. BOULGER, F.L.S., F.G.S. Two Series. With Forty full-page Coloured Plates by W. H. J. BOOT. 12s. 6d. each.
- "Unicode" : The Universal Telegraphic Phrase Book.** Pocket or Desk Edition. 2s. 6d. each.
- United States, Cassell's History of the.** By EDMUND OLLIER. With 600 Illustrations. Three Vols. 9s. each.



**The "Belle Sauvage" Library. Cloth, 2s. each.**

The Fortunes of Nigel.	Last of the Barons.	Old Mortality.
Guy Mannering.	Adventures of Mr. Ledbury.	The Hour and the Man.
Shirley.	Ivanhoe.	Washington Irving's Sketch-Book.
Couningsby.	Oliver Twist.	Last Days of Palmyra.
Mary Barton.	Selections from Hood's Works.	Tales of the Borders.
The Antiquary.	Longfellow's Prose Works.	Pride and Prejudice.
Nicholas Nickleby. Two Vols.	Sense and Sensibility.	Last of the Mohicans.
Jane Eyre.	Lytton's Plays.	Heart of Midlothian.
Wuthering Heights.	Tales, Poems, and Sketches (Bret Harte).	Last Days of Pompeii.
The Prairie.	The Prince of the House of David.	Yellowplush Papers.
Night and Morning.	Sheridan's Plays.	Handy Andy.
Kenilworth.	Uncle Tom's Cabin.	Selected Plays.
The Ingoldsby Legends.	Deerslayer.	American Humour.
Tower of London.	Eugene Aram.	Sketches by Boz.
The Pioneers.	Jack Hinton, the Guardsman.	Macaulay's Lays and Selected Essays.
Charles O'Malley.	Rome and the Early Christians.	Harry Lorrequer.
Barnaby Rudge.	The Trials of Margaret Lyndsay.	Old Curiosity Shop.
Cakes and Ale.	Edgar Allan Poe. Prose and Poetry. Selections from.	Rienzi.
The King's Own.		The Talisman.
People I have Met.		Pickwick. Two Vols.
The Pathfinder.		Scarlet Letter.
Evelina.		Martin Chuzzlewit. Two Vols.
Scott's Poems.		

**Universal History, Cassell's Illustrated.** With nearly ONE THOUSAND ILLUSTRATIONS. Vol. I. Early and Greek History.—Vol. II. The Roman Period.—Vol. III. The Middle Ages.—Vol. IV. Modern History. 9s. each.

**Vicar of Wakefield and other Works,** by OLIVER GOLDSMITH. Illustrated. 3s. 6d.; cloth, gilt edges, 5s.

**Water-Colour Painting, A Course of.** With Twenty-four Coloured Plates by R. P. LEITCH, and full Instructions to the Pupil. 5s.

**Wild Birds, Familiar.** By W. SWAYSLAND. Four Series. With 40 Coloured Plates in each. 12s. 6d. each.

**Wild Flowers, Familiar.** By F. E. HULME, F.L.S., F.S.A. Five Series. With 40 Coloured Plates in each. (In sets only, price on application.)

**Wild Flowers Collecting Book.** In Six Parts, 4d. each.

**Windsor Castle, The Governor's Guide to.** By the Most Noble the MARQUIS OF LORNE, K.T. Profusely Illustrated. Limp Cloth, 1s. Cloth boards, gilt edges, 2s.

**Wood, The Life of the Rev. J. G.** By his Son, the Rev. THEODORE WOOD. With Portrait. Extra crown 8vo, cloth. *Cheap Edition.* 3s. 6d.

**Work.** The Illustrated Journal for Mechanics. *New and Enlarged Series.* Vol. VII. 4s.

**"Work" Handbooks.** A Series of Practical Manuals prepared under the Direction of PAUL N. HASLUCK, Editor of *Work*. Illustrated. Cloth, 1s. each.

**World Beneath the Waters, A.** By Rev. GERARD BANCKS. 3s. 6d.

**World of Wit and Humour, The.** With 400 Illustrations. Cloth, 7s. 6d.

**World of Wonders, The.** With 400 Illustrations. Two Vols. 7s. 6d. each.

**Wrecker, The.** By R. L. STEVENSON and LLOYD OSBOURNE. Illustrated. 6s.

**Yule Tide.** CASSELL'S CHRISTMAS ANNUAL. 1s.

**ILLUSTRATED MAGAZINES.**

**The Quiver,** for Sunday and General Reading. Monthly, 6d.

**Cassell's Family Magazine.** Monthly, 6d.

**"Little Folks" Magazine.** Monthly, 6d.

**The Magazine of Art.** With Three Plates. Monthly, 1s. 4d.

**Cassell's Saturday Journal.** Weekly, 1d.; Monthly, 6d.

**Chums.** The Illustrated Paper for Boys. Weekly, 1d.; Monthly, 6d.

**The Paris Mode and Woman's Household Journal.**

Fully Illustrated. Weekly, 1d.; Monthly, 6d.

**Work.** Illustrated Journal for Mechanics. Weekly, 1d.; Monthly, 6d.

**Cottage Gardening.** Illustrated. Weekly, 1d.; Monthly, 3d.

Full particulars of CASSELL & COMPANY'S Monthly Serial Publications will be found in CASSELL & COMPANY'S COMPLETE CATALOGUE.

**Catalogues of CASSELL & COMPANY'S PUBLICATIONS,** which may be had at all Booksellers', or will be sent post free on application to the Publishers:—

CASSELL'S COMPLETE CATALOGUE, containing particulars of upwards of One Thousand Volumes.

CASSELL'S CLASSIFIED CATALOGUE, in which their Works are arranged according to price, from *Threepence to Fifty Guineas*.

CASSELL'S EDUCATIONAL CATALOGUE, containing particulars of CASSELL & COMPANY'S Educational Works and Students' Manuals.

CASSELL & COMPANY, LIMITED, Ludgate Hill, London.

## Bibles and Religious Works.

**Bible Biographies.** Illustrated. 2s. 6d. each.

The Story of Joseph. Its Lessons for To-Day. By the Rev. GEORGE BAINTON.  
The Story of Moses and Joshua. By the Rev. J. TELFORD.  
The Story of Judges. By the Rev. J. WYCLIFFE GEDGE.  
The Story of Samuel and Saul. By the Rev. D. C. TOVEY.  
The Story of David. By the Rev. J. WILD.

The Story of Jesus. In Verse. By J. R. MACDUFF, D.D.

**Bible, Cassell's Illustrated Family.** With 900 Illustrations. Leather, gilt edges, £2 10s.; full morocco, £3 10s.

**Bible, The, and the Holy Land, New Light on.** By B. T. A. EVETTS, M.A. Illustrated. Cloth, 21s.

**Bible Educator, The.** Edited by E. H. PLUMPTRE, D.D. With Illustrations, Maps, &c. Four Vols., cloth, 6s. each.

**Bible Manual, Cassell's Illustrated.** By the Rev. ROBERT HUNTER, LL.D. Illustrated. 7s. 6d.

**Bible Student in the British Museum, The.** By the Rev. J. G. KITCHIN, M.A. *Entirely New and Revised Edition*, 1s. 4d.

**Biblewomen and Nurses.** Yearly Vol., 3s.

**Bunyan, Cassell's Illustrated.** With 200 Original Illustrations. *Cheap Edition*. 7s. 6d.

**Bunyan's Pilgrim's Progress (Cassell's Illustrated).** 4to. *Cheap Edition*, 3s. 6d.

**Child's Bible, The.** With 200 Illustrations. Demy 4to, 830 pp. 150th Thousand. *Cheap Edition*, 7s. 6d. *Superior Edition*, with 6 Coloured Plates, gilt edges, 10s. 6d.

**Child's Life of Christ, The.** Complete in One Handsome Volume, with about 200 Original Illustrations. *Cheap Edition*, cloth, 7s. 6d.; or with 6 Coloured Plates, cloth, gilt edges, 10s. 6d. Demy 4to, gilt edges, 21s.

**"Come, ye Children."** By the Rev. BENJAMIN WAUGH. Illustrated. 3s. 6d.

**Commentary, The New Testament, for English Readers.** Edited by the Rt. Rev. C. J. ELLICOTT, D.D., Lord Bishop of Gloucester and Bristol. In Three Vols. 21s. each.

Vol. I.—The Four Gospels.

Vol. II.—The Acts, Romans, Corinthians, Galatians.

Vol. III.—The remaining Books of the New Testament.

**Commentary, The Old Testament, for English Readers.** Edited by the Rt. Rev. C. J. ELLICOTT, D.D., Lord Bishop of Gloucester and Bristol. Complete in 5 Vols. 21s. each.

Vol. I.—Genesis to Numbers.

Vol. II.—Deuteronomy to Samuel II.

Vol. III.—Kings I. to Esther.

Vol. IV.—Job to Isaiah.

Vol. V.—Jeremiah to Malachi.

**Commentary, The New Testament.** Edited by Bishop ELLICOTT. Handy Volume Edition. Suitable for School and General Use.

St. Matthew. 3s. 6d.

St. Mark. 3s.

St. Luke. 3s. 6d.

St. John. 3s. 6d.

The Acts of the Apostles. 3s. 6d.

Romans. 2s. 6d.

Corinthians I. and II. 3s.

Galatians, Ephesians, and

Philippians. 3s.

Colossians, Thessalonians, and Timothy. 3s.

Titus, Philemon, Hebrews, and James. 3s.

Peter, Jude, and John.

The Revelation. 3s.

An Introduction to the New Testament. 2s. 6d.

**Commentary, The Old Testament.** Edited by Bishop ELLICOTT. Handy Volume Edition. Suitable for School and General Use.

Genesis. 3s. 6d.

Exodus. 3s.

Leviticus. 3s.

Numbers. 2s. 6d.

Deuteronomy. 2s. 6d.

**Dictionary of Religion, The.** An Encyclopædia of Christian and other Religious Doctrines, Denominations, Sects, Heresies, Ecclesiastical Terms, History, Biography, &c. &c. By the Rev. WILLIAM BENHAM, B.D. *Cheap Edition*, 10s. 6d.

**Doré Bible.** With 230 Illustrations by GUSTAVE DORÉ. *Original Edition*. Two Vols., best morocco, gilt edges, £15. *Popular Edition*. With Full-page Illustrations. In One Vol. 15s. Also in leather binding. (*Price on application*.)

**Early Days of Christianity, The.** By the Very Rev. Dean FARRAR, D.D., F.R.S.

LIBRARY EDITION. Two Vols., 24s.; morocco, £2 2s.

POPULAR EDITION. Complete in One Vol., cloth, 6s.; cloth, gilt edges, 7s. 6d.; Persian morocco, 10s. 6d.; tree-calf, 15s.

**Family Prayer-Book, The.** Edited by the Rev. Canon GARBETT, M.A., and the Rev. S. MARTIN. With Full-page Illustrations. *New Edition*. Cloth, 7s. 6d.

**Gleanings after Harvest.** Studies and Sketches. By the Rev. JOHN R. VERNON, M.A. Illustrated. 6s.



- "Graven in the Rock ;"** or, the Historical Accuracy of the Bible confirmed by reference to the Assyrian and Egyptian Sculptures in the British Museum and elsewhere. By the Rev. Dr. SAMUEL KINNS, F.R.A.S., &c. &c. Illustrated. 12s. 6d.
- "Heart Chords."** A Series of Works by Eminent Divines. Bound in cloth, red edges, 1s. each.
- My Father.** By the Right Rev. Ashton Oxenden, late Bishop of Montreal.
- My Bible.** By the Rt. Rev. W. Boyd Carpenter, Bishop of Ripon.
- My Work for God.** By the Right Rev. Bishop Cotterill.
- My Object in Life.** By the Ven. Archdeacon Farrar, D.D.
- My Aspirations.** By the Rev. G. Matheson, D.D.
- My Emotional Life.** By Preb. Chadwick, D.D.
- My Body.** By the Rev. Prof. W. G. Blaikie, D.D.
- Helps to Belief.** A Series of Helpful Manuals on the Religious Difficulties of the Day. Edited by the Rev. TEIGNMOUTH SHORE, M.A., Canon of Worcester, and Chaplain-in-Ordinary to the Queen. Cloth, 1s. each.
- CREATION.** By Harvey Goodwin, D.D., late Lord Bishop of Carlisle.
- MIRACLES.** By the Rev. Brownlow Maitland, M.A.
- PRAYER.** By the Rev. T. Teignmouth Shore, M.A.
- Holy Land and the Bible, The.** A Book of Scripture Illustrations gathered in Palestine. By the Rev. CUNNINGHAM GEIKIE, D.D., LL.D. (Edin.). With Map. Two Vols. 24s. *Illustrated Edition.* One Vol. 21s.
- Life of Christ, The.** By the Very Rev. Dean FARRAR, D.D., F.R.S., Chaplain-in-Ordinary to the Queen.
- POPULAR EDITION, Revised and Enlarged, extra crown 8vo, cloth gilt, 7s. 6d.
- CHEAP ILLUSTRATED EDITION. Large 4to, cloth, 7s. 6d. Cloth, full gilt, gilt edges, 10s. 6d.
- LIBRARY EDITION. Two Vols. Cloth, 24s.; morocco, 42s.
- Marriage Ring, The.** By WILLIAM LANDELS, D.D. Bound in white leatherette. *New and Cheaper Edition*, 3s. 6d.
- Morning and Evening Prayers for Workhouses and other Institutions.** Selected by LOUISA TWINING. 2s.
- Moses and Geology; or, the Harmony of the Bible with Science.** By the Rev. SAMUEL KINNS, Ph.D., F.R.A.S. Illustrated. Demy 8vo, 8s. 6d.
- My Comfort in Sorrow.** By HUGH MACMILLAN, D.D., LL.D., &c. 1s.
- My Last Will and Testament.** By HYACINTHE LOYSON (PÈRE HYACINTHE). Translated by FABIAN WARE. 1s.; cloth, 1s. 6d.
- New Light on the Bible and the Holy Land.** By BASIL T. A. EVETTS, M.A. Illustrated. Cloth, 21s.
- Old and New Testaments, Plain Introductions to the Books of the.** Containing Contributions by many Eminent Divines. In Two Vols., 3s. 6d. each.
- Plain Introductions to the Books of the Old Testament.** 336 pages. Edited by the Right Rev. C. J. ELLICOTT, D.D., Lord Bishop of Gloucester and Bristol. 3s. 6d.
- Plain Introductions to the Books of the New Testament.** 304 pages. Edited by the Right Rev. C. J. ELLICOTT, D.D., Lord Bishop of Gloucester and Bristol. 3s. 6d.
- Protestantism, The History of.** By the Rev J. A. WYLIE, LL.D. Containing upwards of 600 Original Illustrations. Three Vols., 27s.
- "Quiver" Yearly Volume, The.** With about 600 Original Illustrations and Coloured Frontispiece. 7s. 6d. Also Monthly, 6d.
- St. George for England; and other Sermons preached to Children.** *Fifth Edition.* By the Rev. T. TEIGNMOUTH SHORE, M.A., Canon of Worcester. 5s.
- St. Paul, The Life and Work of.** By the Very Rev. Dean FARRAR, D.D., F.R.S.
- LIBRARY EDITION. Two Vols., cloth, 24s.; calf, 42s.
- ILLUSTRATED EDITION, One Vol., £1 1s.; morocco, £2 2s.
- POPULAR EDITION. One Vol., 8vo, cloth, 6s.; cloth, gilt edges, 7s. 6d.; Persian morocco, 10s. 6d.; tree-calf, 15s.
- Shall We Know One Another in Heaven?** By the Rt. Rev. J. C. RYLE, D.D., Bishop of Liverpool. *New and Enlarged Edition.* Paper Covers, 6d.
- Shortened Church Services and Hymns,** suitable for use at Children's Services. Compiled by the Rev. T. TEIGNMOUTH SHORE, M.A., Canon of Worcester. *Enlarged Edition.* 1s.
- Signa Christi: Evidences of Christianity set forth in the Person and Work of Christ.** By the Rev. JAMES AITCHISON. 5s.
- "Sunday:" Its Origin, History, and Present Obligation.** By the Ven. Archdeacon HESSEY, D.C.L. *Fifth Edition*, 7s. 6d.
- Twilight of Life, The: Words of Counsel and Comfort for the Aged.** By JOHN ELLERTON, M.A. 1s. 6d.

## **Educational Works and Students' Manuals.**

- Agricultural Text-Books, Cassell's.** (The "Downton" Series.) Fully Illustrated. Edited by JOHN WRIGHTSON, Professor of Agriculture. **Soils and Manures.** By J. M. H. Munro, D.Sc. (London), F.I.C., F.C.S. 2s. 6d. **Farm Crops.** By Professor Wrightson, 2s. 6d. **Live Stock.** By Professor Wrightson. 2s. 6d.
- Alphabet, Cassell's Pictorial.** Mounted on Linen, with rollers. 3s. 6d.
- Arithmetic:—Howard's Art of Reckoning.** By C. F. HOWARD. Paper, 1s.; cloth, 2s. *Enlarged Edition*, 5s.
- Arithmetics, The "Belle Sauvage."** By GEORGE RICKS, B.Sc. Lond. With Test Cards. (*List on application*.)
- Atlas, Cassell's Popular.** Containing 24 Coloured Maps. 2s. 6d.
- Book-Keeping.** By THEODORE JONES. FOR SCHOOLS, 2s.; or cloth, 3s. FOR THE MILLION, 2s.; or cloth, 3s. Books for Jones's System, Ruled Sets of, 2s.
- British Empire Map of the World.** New Map for Schools and Institutes. By G. R. PARKIN and J. G. BARTHOLOMEW, F.R.G.S. Mounted on cloth, varnished, and with Rollers or Folded. 25s.
- Chemistry, The Public School.** By J. H. ANDERSON, M.A. 2s. 6d.
- Cookery for Schools.** By LIZZIE HERITAGE. 6d.
- Dulce Domum.** Rhymes and Songs for Children. Edited by JOHN FARMER, Editor of "Gaudemus," &c. Old Notation and Words, 5s. N.B.—The Words of the Songs in "Dulce Domum" (with the Airs both in Tonic Sol-Fa and Old Notation) can be had in Two Parts, 6d. each.
- English Literature, A First Sketch of,** from the Earliest Period to the Present Time. By Prof. HENRY MORLEY. 7s. 6d.
- Euclid, Cassell's.** Edited by Prof. WALLACE, M.A. 1s.
- Euclid, The First Four Books of.** *New Edition.* In paper, 6d.; cloth, 9d.
- French, Cassell's Lessons in.** *New and Revised Edition.* Parts I. and II., each, 2s. 6d.; complete, 4s. 6d. Key, 1s. 6d.
- French-English and English-French Dictionary.** *Entirely New and Enlarged Edition.* 1,150 pages, 8vo, cloth, 3s. 6d.
- French Reader, Cassell's Public School.** By GUILLAUME S. CONRAD. 2s. 6d.
- Galbraith and Haughton's Scientific Manuals.**  
Plane Trigonometry. 2s. 6d. Euclid. Books I., II., III. 2s. 6d. Books IV., V., VI. 2s. 6d. Mathematical Tables. 3s. 6d. Mechanics. 3s. 6d. Natural Philosophy. 3s. 6d. Optics. 2s. 6d. Hydrostatics. 3s. 6d. Steam Engine. 3s. 6d. Algebra. Part I., cloth, 2s. 6d. Complete, 7s. 6d. Tides and Tidal Currents, with Tidal Cards, 3s.
- Gaudemus.** Songs for Colleges and Schools. Edited by JOHN FARMER. 5s. Words only, paper, 6d.; cloth, 9d.
- Geometry, First Elements of Experimental.** By PAUL BERT. Illustrated. 1s. 6d.
- Geometry, Practical Solid.** By Major ROSS, R.E. 2s.
- German Dictionary, Cassell's New.** German-English, English-German. *Cheap Edition*, cloth, 3s. 6d. *Superior Edition*, 5s.
- German Reading, First Lessons in.** By A. JÄGST. Illustrated. 1s.
- Hand and Eye Training.** By GEORGE RICKS, B.Sc., and JOSEPH VAUGHAN. Illustrated. Vol. I. Designing with Coloured Papers. Vol. II. Cardboard Work. 2s. each. Vol. III. Colour Work and Design, 3s.
- Hand and Eye Training.** By G. RICKS, B.Sc. Two Vols., with 16 Coloured Plates in each Vol. Crown 4to, 6s. each.
- "Hand and Eye Training" Cards for Class Work.** Five sets in case. 1s. each.
- Historical Cartoons, Cassell's Coloured.** Size 45 in. x 35 in. 2s. each. Mounted on canvas and varnished, with rollers, 5s. each. (Descriptive pamphlet, 16 pp., 1d.)
- Historical Course for Schools, Cassell's.** Illustrated throughout. The Simple Outline of English History, 1s. 3d. The Class History of England, 2s. 6d.
- Italian Lessons, with Exercises, Cassell's.** In One Vol. 3s. 6d.
- Kidnapped.** By ROBERT LOUIS STEVENSON. Illustrated. 6s.
- Latin Dictionary, Cassell's New.** (Latin-English and English-Latin.) Revised by J. R. V. MARCHANT, M.A., and J. F. CHARLES, B.A. 3s. 6d. *Superior Edition*, 5s.
- Latin Primer, The New.** By Prof. J. P. POSTGATE. 2s. 6d.
- Latin Primer, The First.** By Prof. POSTGATE. 1s.
- Latin Prose for Lower Forms.** By M. A. BAYFIELD, M.A. 2s. 6d.
- Laws of Every-Day Life.** For the Use of Schools. By H. O. ARNOLD-FORSTER, M.P. 1s. 6d. *Special Edition* on green paper for those with weak eyesight, 2s.



- Lessons in Our Laws ; or, Talks at Broadacre Farm.** By H. F. LESTER, B.A.  
Part I. : THE MAKERS AND CARRIERS-OUT OF THE LAW. Part II. : LAW COURTS  
AND LOCAL RULE, &c. 1s. 6d. each.
- Little Folks' History of England.** By ISA CRAIG-KNOX. Illustrated. 1s. 6d.
- Making of the Home, The.** By Mrs. SAMUEL A. BARNETT. 1s. 6d.
- Marlborough Books:**—Arithmetic Examples. 3s. French Exercises 3s. 6d. French  
Grammar. 2s. 6d. German Grammar. 3s. 6d.
- Mechanics for Young Beginners, A First Book of.** By the Rev. J. G. EASTON,  
M.A. 4s. 6d.
- Mechanics and Machine Design, Numerical Examples in Practical.** By  
R. G. BLAINE, M.E. *New Edition, Revised and Enlarged.* With 79 Illustrations.  
Cloth, 2s. 6d.
- Natural History Coloured Wall Sheets, Cassell's New.** Consisting of 17  
subjects. Size, 39 by 31 in. Mounted on rollers and varnished. 3s. each.
- Object Lessons from Nature.** By Prof. L. C. MIALI, F.L.S., F.G.S. Fully  
Illustrated. *New and Enlarged Edition.* Two Vols. 1s. 6d. each.
- Physiology for Schools.** By ALFRED T. SCHOFIELD, M.D., M.R.C.S., &c.  
Illustrated. 1s. 9d. Three Parts, paper covers, 5d. each ; or cloth limp, 6d. each.
- Poetry Readers, Cassell's New.** Illustrated. 12 Books. 1d. each. Cloth, 1s. 6d.
- Popular Educator, Cassell's New.** With Revised Text, New Maps, New Coloured  
Plates, New Type, &c. Complete in Eight Vols., 5s. each ; or Eight Vols. in  
Four, half-morocco, 5os.
- Readers, Cassell's "Belle Sauvage."** An Entirely New Series. Fully Illus-  
trated. Strongly bound in cloth. (*List on application.*)
- Reader, The Citizen.** By H. O. ARNOLD-FORSTER, M.P. Cloth, 1s. 6d. ; also a  
Scottish Edition, cloth, 1s. 6d.
- Reader, The Temperance.** By Rev. J. DENNIS HIRD. 1s. 6d.
- Readers, Cassell's "Higher Class."** (*List on application.*)
- Readers, Cassell's Readable.** Illustrated. (*List on application.*)
- Readers for Infant Schools, Coloured.** Three Books. 4d. each.
- Readers, Geographical, Cassell's New.** With Numerous Illustrations in each  
Book. (*List on application.*)
- Readers, The Modern Geographical.** Illustrated throughout. (*List on application.*)
- Readers, The Modern School.** Illustrated. (*List on application.*)
- Reading and Spelling Book, Cassell's Illustrated.** 1s.
- Round the Empire.** By G. R. PARKIN. With a Preface by the Rt. Hon. the  
Earl of Rosebery, K.G. Fully Illustrated. 1s. 6d.
- Science Applied to Work.** By J. A. BOWER. Illustrated. 1s.
- Science of Every-Day Life.** By J. A. BOWER. Illustrated. 1s.
- Sculpture, A Primer of.** By E. ROSCOE MULLINS. Illustrated. 2s. 6d.
- Shade from Models, Common Objects, and Casts of Ornament, How to.** By  
W. E. SPARKES. With 25 Plates by the Author. 3s.
- Shakspeare's Plays for School Use.** Illustrated. 9 Books. 6d. each.
- Spelling, A Complete Manual of.** By J. D. MORELL, LL.D. 1s.
- Technical Educator, Cassell's New.** An entirely New Cyclopædia of Technical  
Education, with Coloured Plates and Engravings. In Vols., 5s. each.
- Technical Manuals, Cassell's.** Illustrated throughout. 16 Vols., from 2s. to 4s. 6d.  
(*List free on application.*)
- Technology, Manuals of.** Edited by Prof. AYRTON, F.R.S., and RICHARD  
WORMELL, D.Sc., M.A. Illustrated throughout. (*List on application.*)
- Things New and Old ; or, Stories from English History.** By H. O. ARNOLD-  
FORSTER, M.P. Fully Illustrated. Strongly bound in Cloth. Standards I. and II.,  
.. 9d. each ; Standard III., 1s. ; Standard IV., 1s. 3d. ; Standards V., VI., and VII.,  
1s. 6d. each.
- World of Ours, This.** By H. O. ARNOLD-FORSTER, M.P. Fully Illustrated. 3s. 6d.

## Books for Young People.

**"Little Folks" Half-Yearly Volume.** Containing 432 pages of Letterpress, with Pictures on nearly every page, together with Six Full-page Plates printed in Colours. Coloured boards, 3s. 6d.; or cloth gilt, gilt edges, 5s.

**Bo-Peep.** A Book for the Little Ones. With Original Stories and Verses. Illustrated with beautiful Pictures on nearly every page, and Coloured Frontispiece. Yearly Vol. Elegant picture boards, 2s. 6d.; cloth, 3s. 6d.

**Beneath the Banner.** Being Narratives of Noble Lives and Brave Deeds. By F. J. CROSS. Illustrated. Limp cloth, 1s.; cloth gilt, gilt edges, 2s.

**Good Morning! Good Night!** Morning and Evening Readings for Children, by the Author of "Beneath the Banner." Fully Illustrated. Limp cloth, 1s., or cloth boards, gilt lettered, 2s.

**Told Out of School.** By A. J. DANIELS. Illustrated. 3s. 6d.

**Red Rose and Tiger Lily.** By L. T. MEADE. Illustrated. 3s. 6d.

**Five Stars in a Little Pool.** By EDITH CARRINGTON. Illustrated. 6s.

**Beyond the Blue Mountains.** By L. T. MEADE. Illustrated. 5s.

**The Cost of a Mistake.** By SARAH PITT. Illustrated. *New Edition.* 2s. 6d.

**The Romance of Invention: Vignettes from the Annals of Industry and Science.** By JAMES BURNLEY. Illustrated. 3s. 6d.

**The Peep of Day.** Cassell's Illustrated Edition. 2s. 6d.

**Maggie Steele's Diary.** By E. A. DILLWYN. 2s. 6d.

**A Book of Merry Tales.** By MAGGIE BROWNE, SHEILA, ISABEL WILSON, and C. L. MATÉAUX. Illustrated. 3s. 6d.

**A Sunday Story-Book.** By MAGGIE BROWNE, SAM BROWNE, and AUNT ETHEL. Illustrated. 3s. 6d.

**A Bundle of Tales.** By MAGGIE BROWNE, SAM BROWNE, & AUNT ETHEL. 3s. 6d.

**Story Poems for Young and Old.** By E. DAVENPORT. 3s. 6d.

**Pleasant Work for Busy Fingers.** By MAGGIE BROWNE. Illustrated. 5s.

**Magic at Home.** By Prof. HOFFMAN. Fully Illustrated. A Series of easy and startling Conjuring Tricks for Beginners. Cloth gilt, 3s. 6d.

**Schoolroom and Home Theatricals.** By ARTHUR WAUGH. With Illustrations by H. A. J. MILES. *New Edition.* Paper, 1s.; cloth, 1s. 6d.

**Little Mother Bunch.** By Mrs. MOLESWORTH. Illustrated. *New Edition.* 2s. 6d.

**Heroes of Every-Day Life.** By LAURA LANE. With about 20 Full-page Illustrations. 256 pages, crown 8vo, cloth, 2s. 6d.

**Ships, Sailors, and the Sea.** By R. J. CORNEWALL-JONES. Illustrated throughout, and containing a Coloured Plate of Naval Flags. *Cheap Edition,* 2s. 6d.

**Gift Books for Young People.** By Popular Authors. With Four Original Illustrations in each. Cloth gilt, 1s. 6d. each.

**The Boy Hunters of Kentucky.** By Edward S. Ellis.

**Red Feather: a Tale of the American Frontier.** By Edward S. Ellis.

**Fritters: or, "It's a Long Lane that has no Turning."**

**Trixy; or, "Those who Live in Glass Houses shouldn't throw Stones."**

**The Two Hardecassies.**

**Seeking a City.**

**Rhoda's Reward.**

**Jack Marston's Anchor.**

**Frank's Life-Battle.**

**Major Monk's Motto; or, "Look Before you Leap."**

**Tim Thomson's Trial; or, "All is not Gold that Glitters."**

**Ursula's Stumbling-Block.**

**Ruth's Life-Work; or, "No Pains, no Gains."**

**Rags and Rainbows.**

**Uncle William's Charge.**

**Pretty Pink's Purpose.**

**"Golden Mottoes" Series, The.** Each Book containing 208 pages, with Four full-page Original Illustrations. Crown 8vo, cloth gilt, 2s. each.

**"Nil Desperandum."** By the Rev. F. Langbridge, M.A.

**"Bear and Forbear."** By Sarah Pitt.

**"Foremost if I Can."** By Helen Atteridge.

**"Honour is my Guide."** By Jeanie Hering (Mrs. Adams-Acton).

**"Aim at a Sure End."** By Emily Searchfield.

**"He Conquers who Endures."** By the Author of "May Cunningham's Trial," &c.

**"Cross and Crown" Series, The.** With Four Illustrations in each Book. Crown 8vo, 256 pages, 2s. 6d. each.

**Heroes of the Indian Empire; or, Stories of Valour and Victory.** By Ernest Foster.

**Through Trial to Triumph; or, "The Royal Way."** By Madeline Bonavia Hunt.

**In Letters of Flame: A Story of the Waldenses.** By C. L. Matéaux.

**Strong to Suffer: A Story of the Jews.** By E. Wynne.

**By Fire and Sword: A Story of the Huguenots.** By Thomas Archer.

**Adam Hepburn's Vow: A Tale of Kirk and Covenant.** By Annie S. Swan.

**No. XIII.; or, The Story of the Lost Vestal.** A Tale of Early Christian Days. By Emma Marshall.

**Freedom's Sword: A Story of the Days of Wallace and Bruce.** By Annie S. Swan.



**Albums for Children.** Price 3s. 6d. each.

The Chit-Chat Album. Illustrated.  
The Album for Home, School, and Play.  
Set in bold type, and illustrated throughout.

**"Wanted—a King" Series.** *Cheap Edition.* Illustrated. 2s. 6d. each.

Robin's Ride. By Ellinor Davenport Adams.  
Great-Grandmamma. By Georgina M. Synge.  
Fairy Tales in Other Lands. By Julia Goddard.

My Own Album of Animals. Illustrated.

Picture Album of All Sorts. Illustrated.

Wanted—a King; or, How Merle set the Nursery Rhymes to Rights. By Maggie Browne.

**"Peeps Abroad" Library.** *Cheap Editions.* Cloth gilt, 2s. 6d. each.

Rambles Round London. By C. L.

Matéaux. Illustrated.

Around and About Old England. By C.

L. Matéaux. Illustrated.

Paws and Claws. By one of the Authors of

"Poems Written for a Child." Illustrated.

Decisive Events in History. By Thomas

Archer. With Original Illustrations.

The True Robinson Crusoes.

Peeps Abroad for Folks at Home. Illustrated throughout.

Wild Adventures in Wild Places. By Dr. Gordon Stables, R.N. Illustrated.

Modern Explorers. By Thomas Frost. Illustrated. *New and Cheaper Edition.*

Early Explorers. By Thomas Frost.

Home Chat with our Young Folks. Illustrated throughout.

Jungle, Peak, and Plain. Illustrated throughout.

**Three-and-Sixpenny Books for Young People.** With Original Illustrations.

Cloth gilt, 3s. 6d. each.

† Bashful Fifteen. By L. T. MEADE.  
The King's Command. A Story for Girls.  
By Maggie Symington.

† A Sweet Girl Graduate. By L. T. Meade.

† The White House at Inch Gow. By Sarah Pitt.

Lost in Samoa. A Tale of Adventure in the Navigator Islands. By E. S. Ellis.

Tad; or, "Getting Even" with Him. By E. S. Ellis.

† Polly. By L. T. Meade.

† The Palace Beautiful. By L. T. Meade.

"Follow my Leader."

For Fortune and Glory.

Lost among White Africans.

† A World of Girls. By L. T. Meade.

Books marked thus † can also be had in extra cloth gilt, gilt edges, 5s. each.

**Books by Edward S. Ellis.** Illustrated. Cloth, 2s. 6d. each.

The Hunters of the Ozark.  
The Camp in the Mountains.

Ned in the Woods. A Tale

of Early Days in the West.

Down the Mississippi.

The Last War Trail.

Ned on the River. A Tale

of Indian River Warfare.

Footprints in the Forest.

Up the Tapajos.

The Great Cattle Trail.

Ned in the Blook House.

A Story of Pioneer Life in Kentucky.

The Lost Trail.

Camp-Fire and Wigwam.

Lost in the Wilds.

**Sixpenny Story Books.** By well-known Writers. All Illustrated.

The Smuggler's Cave.

Little Lizzie.

The Boat Club.

Luke Barnicott.

Little Bird.

Little Pickles.

The Elcheater College

Boys.

My First Cruise.

The Little Peacemaker.

The Delft Jug.

**Cassell's Picture Story Books.** Each containing 60 pages. 6d. each.

Little Talks.  
Bright Stars.  
Nursery Joys.  
Pet's Posy.  
Tiny Tales.

Daisy's Story Book.  
Dot's Story Book.  
A Nest of Stories.  
Good Night Stories.  
Chats for Small Chatterers.

Auntie's Stories.  
Birdie's Story Book.  
Little Chimes.  
A Sheaf of Tales.  
Dewdrop Stories.

**Illustrated Books for the Little Ones.** Containing interesting Stories. All

Illustrated. 1s. each; or cloth gilt, 1s. 6d.

Bright Tales and Funny Pictures.

Merry Little Tales.

Little Tales for Little People.

Little People and Their Pets.

Tales Told for Sunday.

Sunday Stories for Small People.

Stories and Pictures for Sunday.

Bible Pictures for Boys and Girls.

Firelight Stories.

Sunlight and Shade.

Rub-a-dub Tales.

Fine Feathers and Fluffy Fur.

Sorambles and Sorapes.

Tittle Tattle Tales.

Dumb Friends.

Indoors and Out.

Some Farm Friends.

Those Golden Sands.

Little Mothers and their Children.

Our Pretty Pets.

Our Schoolday Hours.

Creatures Tame.

Creatures Wild.

Up and Down the Garden.

All Sorts of Adventures.

Our Sunday Stories.

Our Holiday Hours.

Wandering Ways.

**Shilling Story Books.** All Illustrated, and containing Interesting Stories.

Seventeen Cats.  
Bunty and the Boys.  
The Heir of Elmdale.  
The Mystery at Shoncliff School.  
Claimed at Last, and Roy's Reward.  
Thorns and Tangles.

The Cuckoo in the Robin's Nest.  
John's Mistake. (Nest.)  
Diamonds in the Sand.  
Surly Bob.  
The History of Five Little Pitchers.  
The Giant's Cradle.  
Shag and Doll.

Aunt Lucia's Looket.  
The Magic Mirror.  
The Cost of Revenge.  
Clever Frank.  
Among the Redskins.  
The Ferryman of Brill.  
Harry Maxwell.  
A Banished Monarch.

**Eighteenpenny Story Books.** All Illustrated throughout.

Wee Willie Winkie.	Raggles, Baggles, and the Emperor.	Tom Morris's Error.
Ups and Downs of a Donkey's Life.	Roses from Thorns.	Worth more than Gold.
Three Wee Ulster Lassies.	Faith's Father.	"Through Flood—Through Fire."
Up the Ladder.	By Land and Sea.	The Girl with the Golden Locks.
Dick's Hero; & other Stories.	The Young Berringtons.	Stories of the Olden Time.
The Chip Boy.	Jeff and Luff.	

**"Little Folks" Painting Books.** With Text, and Outline Illustrations for Water-Colour Painting.

The New "Little Folks" Painting Book. Containing nearly 350 Outline Illustrations suitable for Colouring. 1s.	The "Little Folks" Proverb Painting Book. Cloth only, 2s.
---	---

**Library of Wonders.** Illustrated Gift-books for Boys. Cloth, 1s. 6d.

Wonderful Adventures.	Wonders of Animal Instinct.
Wonderful Escapes.	Wonderful Balloon Ascents.
Wonders of Bodily Strength and Skill.	

**The "World in Pictures" Series.** Illustrated throughout. *Cheap Edition.* 1s. 6d. each

A Ramble Round France.	The Eastern Wonderland (Japan).
All the Russias.	Glimpses of South America.
Chats about Germany.	Round Africa.
Peeps into China.	The Land of Temples (India).
The Land of Pyramids (Egypt).	The Isles of the Pacific.

**Cheap Editions of Popular Volumes for Young People.** Illustrated. 2s. 6d. each.

In Quest of Gold; or, Under the Whanga Falls.	Esther West.	Working to Win.
On Board the <i>Esmeralda</i> ; or, Martin Leigh's Log.	Three Homes.	Perils Afloat and Brigands Ashore.
	For Queen and King.	

**Two-Shilling Story Books.** All Illustrated.

Margaret's Enemy.	Madge and her Friends.	Two Fourpenny Bits.
Stories of the Tower.	The Children of the Court.	Poor Nelly.
Mr. Burke's Nieces.	Maid Marjory.	Tom Heriot.
May Cunningham's Trial.	The Four Cats of the Tip-pertons.	Aunt Tabitha's Waifs.
The Top of the Ladder: How to Reach it.	Marion's Two Homes.	In Mischief Again.
Little Flotsam.	Little Folks' Sunday Book.	Through Peril to Fortune.
		Peggy, and other Tales.

**Half-Crown Story Books.**

Pen's Perplexities.	At the South Pole.
Notable Shipwrecks.	Pictures of School Life and Boyhood.

**Cassell's Pictorial Scrap Book.** In Six Sectional Volumes. Paper boards, cloth back, 3s. 6d. per Vol.

Our Scrap Book.	The Magpie Scrap Book.
The Seaside Scrap Book.	The Lion Scrap Book.
The Little Folks' Scrap Book.	The Elephant Scrap Book.

**Books for the Little Ones.** Fully Illustrated.

Rhymes for the Young Folk. By William Allingham. Beautifully Illustrated. 3s. 6d.	Cassell's Robinson Crusoe. With 100 Illustrations. Cloth, 3s. 6d.; gilt edges, 5s.
The Sunday Scrap Book. With Several Hundred Illustrations. Boards, 3s. 6d.; cloth, gilt edges, 5s.	The Old Fairy Tales. With Original Illustrations. Boards, 1s.; cloth, 1s. 6d.
The History Scrap Book. With nearly 1,000 Engravings. Cloth, 7s. 6d.	Cassell's Swiss Family Robinson. Illustrated. Cloth, 3s. 6d.; gilt edges, 5s.

**The World's Workers.** A Series of New and Original Volumes by Popular Authors. With Portraits printed on a tint as Frontispiece. 1s. each.

John Cassell. By G. Holden Pike.	Dr. Guthrie, Father Mathew, Elihu Burritt, Joseph Livesey.
Charles Haddon Spurgeon. By G. Holden Pike.	Sir Henry Havelock and Colin Campbell Lord Clyde.
Dr. Arnold of Rugby. By Rose E. Selfe.	Abraham Lincoln.
The Earl of Shaftesbury.	David Livingstone.
Sarah Robinson, Agnes Weston, and Mrs. Meredith.	George Muller and Andrew Reed.
Thomas A. Edison and Samuel F. B. Morse.	Richard Cobden.
Mrs. Somerville and Mary Carpenter.	Benjamin Franklin.
General Gordon.	Handel.
Charles Dickens.	Turner the Artist.
Florence Nightingale, Catherine Marsh, Frances Ridley Havergal, Mrs. Ranyard ("L. N. R.").	George and Robert Stephenson.
	Sir Titus Salt and George Moore.

\*.\* The above Works can also be had Three in One Vol., cloth, gilt edges, 3s.

CASSELL & COMPANY, Limited, Ludgate Hill, London;  
Paris & Melbourne.





